Chapter 4

Future Conditions

INTRODUCTION

vRide corporate vanpooling service. Source: Fairfax County.

GROWTH AND CHANGE

As a part of the Vision Plan development process, a rigorous future conditions and gap analysis effort was conducted. This future conditions analysis compiled recommendations from plans from across the study area and evaluated them against Super NoVa plan development goals as well as forecasted population, employment, travel demand, and land use information. The collective set of future conditions information was used to identify anticipated gaps in programs, services, and policies that would need to be addressed during the follow-up needs analysis.

This chapter looks at a summary of future adopted comprehensive, transportation, and other relevant plans from localities across the region. It evaluates the effects of anticipated future growth of the region and the system currently planned. This section also documents travel demand for work and non-work trips, population and employment forecasts, and future land use plans.

REGIONAL COMPREHENSIVE PLANNING

Passengers board a train at the East Falls Church Metrorail station.

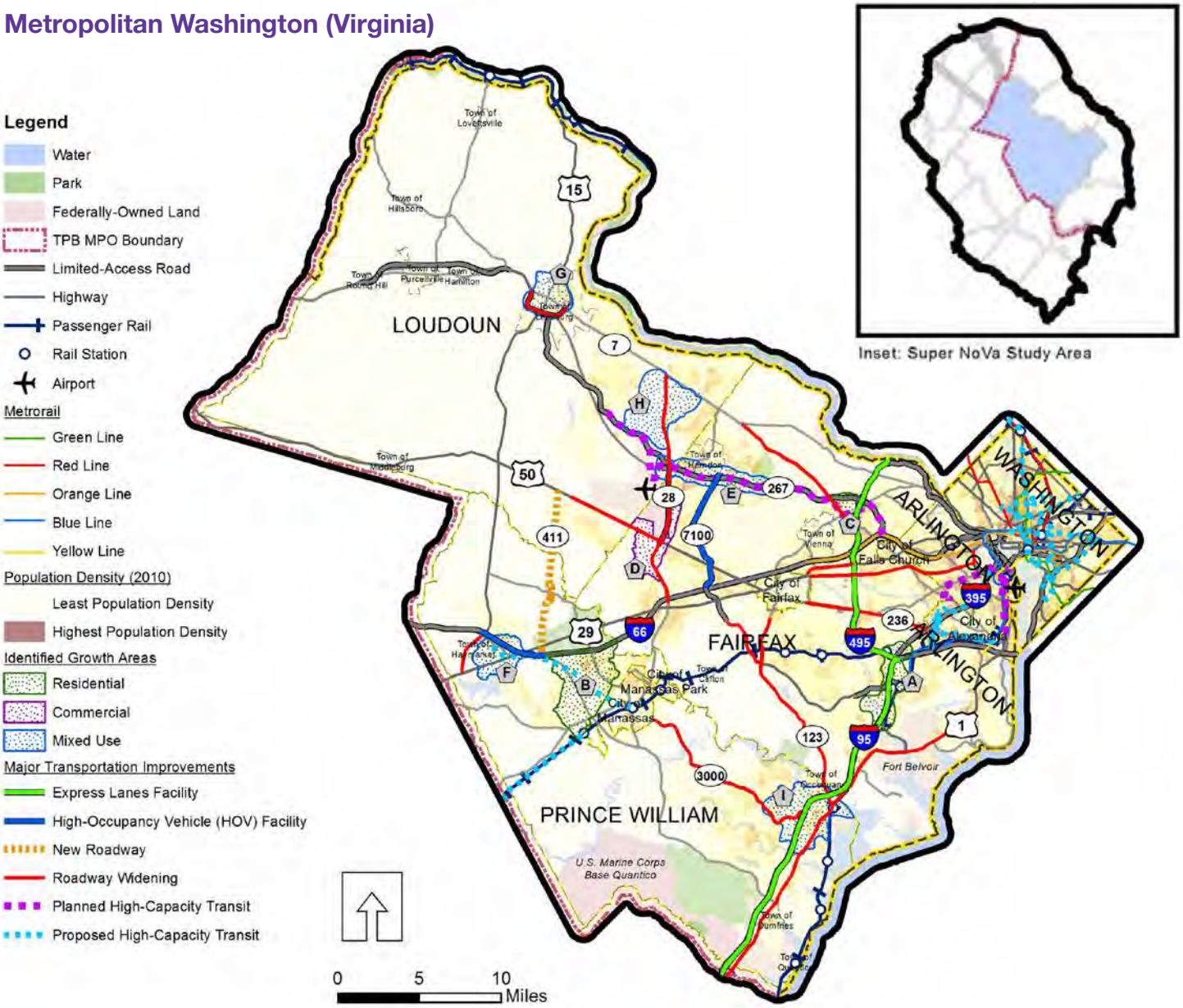
When developing recommendations for the future, it is important to understand the plans and projects that have been previously developed by different jurisdictions and agencies. Master transportation and comprehensive plans from metropolitan planning organizations (MPO), state and federal agencies, and local jurisdictions were reviewed to ensure that the recommendations set forth by Super NoVa could build on the framework for the future of the region already in place. A list of all plans that were considered can be found in the **Appendix**.

While all plans contain recommendations and policies specific to the jurisdiction or agency, common themes in many of the plans include:

- The need to accommodate forecast growth and activity shifts in the region
- Promoting multimodal solutions to increased congestion on the region's roadways
- Incorporating land use and transit-oriented development into planning
- Creating a safe and interconnected network for bicyclists and pedestrians
- Maintaining public open space and sensitive environmental areas
- Using transportation demand management (TDM) and technology to reduce dependence of single occupancy vehicle trip

Summaries of the reviewed comprehensive and transportation plans are shown in **Figure 4.1** though **Figure 4.6.**

Metropolitan Washington (Virginia)



Growth Areas

Residential

A. I-95/Springfield
B. Manassas
C. Tysons Corner

Commercial

D. South Dulles

Mixed Use

E. Dulles Corridor
F. Gainesville
G. Leesburg
H. North Dulles
I. Potomac/Woodbridge

Primary Transportations Corridors

Primary East-West Corridors

- I-66, I-395, and I-495
- US Routes 1, 29, and 50
- VA State Route 236

Primary North-South Corridors

- I-95, I-270, and I-495
- US Route 15
- VA State Routes 7, 28, 123, 267, 3000, and 286

TDM Agencies

- Arlington County Commuter Services
- City of Alexandria Local Motion
- Dulles Area Transportation Association (DATA)
- Fairfax County Transportation Services Group
- goDCgo
- Loudoun County Office of Transportation Services
- MWCOG Commuter Connections
- Potomac and Rappahannock Transportation Commission (PRTC) (OmniMatch)

Sources: 2010 Congestion Management Process Technical Report, *National Capital Region Transportation Planning Board, September 2010;* The Financially Constrained Long-Range Transportation Plan for the National Capital Region, *National Capital Regional Transportation Planning Board, November 2010;* Metropolitan Washington Regional Activity Centers and Clusters, *Metropolitan Washington Coalition of Governments, April 2007.*
Note: Individual jurisdiction comprehensive and transportation plans (where applicable) also were consulted.

Figure 4.1: Comprehensive and Transportation Plans Summary – Inner Subarea
Metropolitan Washington Council of Governments (MWCOG) and National Capital Region Transportation Planning Board (TPB)
Arlington, Fairfax, Loudoun, and Prince William Counties; the District of Columbia; and Cities of Alexandria, Falls Church, Fairfax, and Manassas and Manassas Park

Population

Jurisdiction Name	State	2010 Population	2040 Population	Overall Growth	Overall Percentage Growth	Annual Growth
Arlington County#	VA	208,000	252,000	44,000	21%	0.6%
City of Alexandria#	VA	140,000	188,000	48,000	35%	1.0%
City of Fairfax*	VA	23,000	27,000	4,000	21%	0.6%
City of Falls Church*	VA	12,000	17,000	5,000	40%	1.1%
City of Manassas*	VA	38,000	54,000	16,000	44%	1.2%
City of Manassas Park!	VA	14,000	21,000	7,000	52%	1.4%
District of Columbia#	D.C.	602,000	761,000	159,000	26%	0.8%
Fairfax County#	VA	1,082,000	1,281,000	199,000	18%	0.6%
Loudoun County#	VA	312,000	440,000	128,000	41%	1.1%
Prince William County#	VA	402,000	564,000	162,000	40%	1.1%
Total		2,833,000	3,605,000	772,000	27%	0.8%

*Sources: * Jurisdiction Comprehensive Plan or Staff Projection # MWCOG Round 8.0 Forecasts ! Virginia Employment Commission*

Transit Service Providers

Washington, D.C.
- Metrobus
- D.C. Circulator
- Metrorail
- Virginia Railway Express (VRE)
- Maryland Area Regional Commuter (MARC)
- Amtrak

Arlington County
- ART
- Metrobus
- Metrorail
- VRE

Fairfax County
- Fairfax Connector
- Metrobus
- Metrorail
- VRE

Loudoun County
- Loudoun County Transit (LC Transit)
- Virginia Regional Transit (VRT)
- Prince William County
- PRTC OmniRide and OmniLink
- VRE and Amtrak

City of Alexandria
- DASH
- Metrobus
- Metrorail, VRE, and Amtrak

City of Falls Church
- Metrobus
- Metrorail

City of Fairfax
- City-University Energysaver (CUE)
- Metrobus

Mobility Issues

Existing
- Top Delay Corridors [level of service (LOS) E or worse] – a.m. peak period
  - I-66 eastbound from VA 234 and VA 267
  - I-95 northbound between Dale Boulevard and Lorton Road
  - I-395 northbound between Franconia Road and VA 7
- Top Delay Corridor (LOS E or worse) – p.m. peak period
  - Southwest/Southeast Freeway northbound between VA 27 and Pennsylvania Avenue
- Arterial Congestion (LOS E or worse) – p.m. peak period
  - Virginia – US 1, US 29, VA 123, and VA 286 (Fairfax County Parkway)
  - D.C. – Wisconsin Avenue, 17th Street, I Street, and H Street

Future (2040)
- Daily vehicle miles of travel to increase 22 percent by 2040
- Daily lane-miles of congestion to increase 38 percent by 2040
- I-95 and I-495 in Virginia forecast to improve due high-occupancy toll (HOT) lanes
- Loudoun and Prince William to experience greatest increase in congestion of the region

Committed Roadway Projects

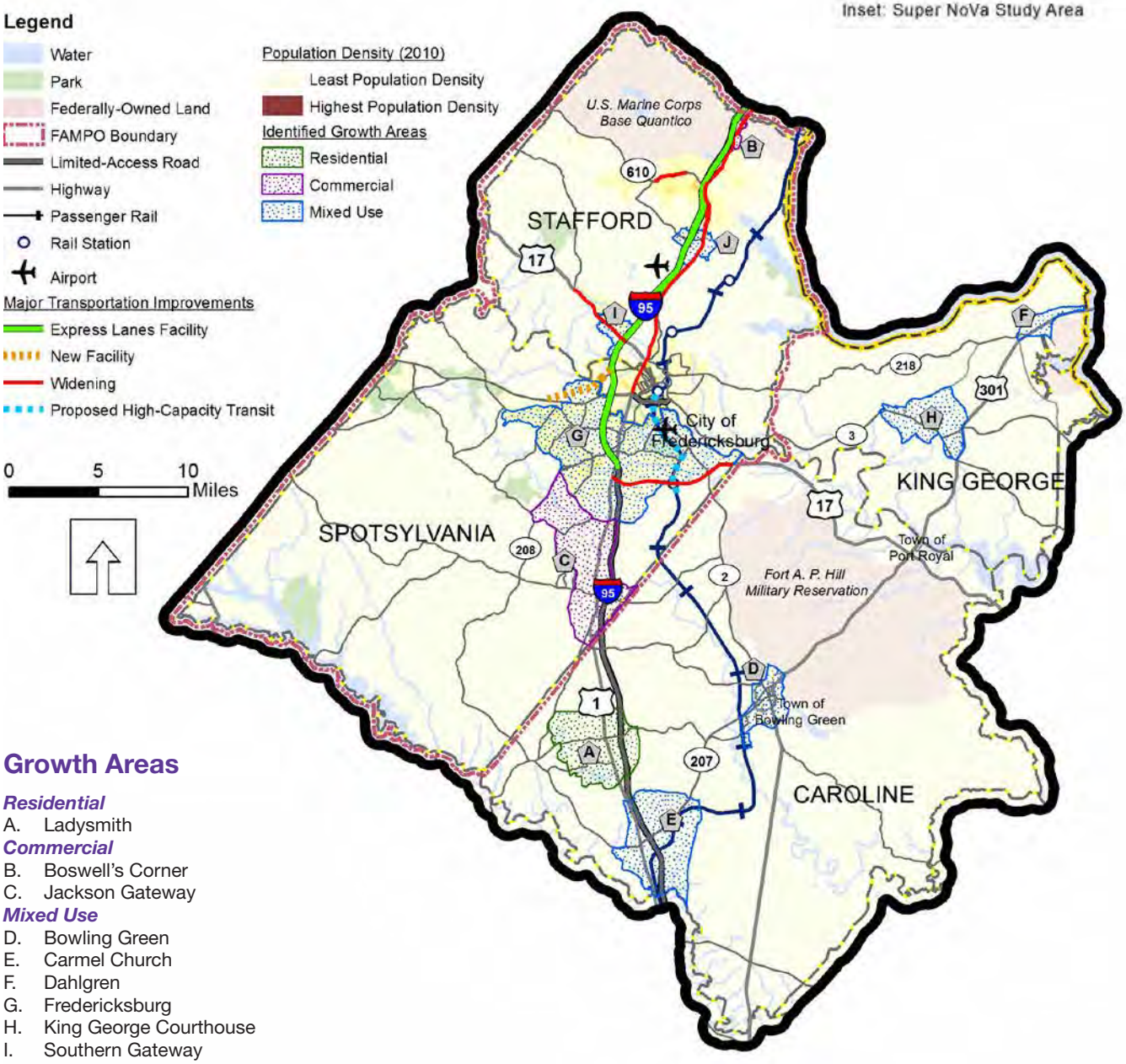
Facility	Improvement Type	Lanes From	Lanes To	Limits	Year
I-66	Add 2 HOV Lanes	4	6	US 15 and US 29	2018
I-95	Widen	6	8	VA 286 and Prince William County	2011
I-395 HOV	Widen HOV Lanes	2	3	Turkeycock Run and I-495	2015
I-495	Add 4 HOT Lanes	8	12	VA 193 (Georgetown Pike) and I-95	2030
I-95 HOT	Convert 2 HOV Lanes to HOT	2	2	I-495 and VA 234 (Dumfries Road)	2012
I-95 HOT	Add 2 HOT Lanes	0	2	VA 234 (Dumfries Road) and VA 610	2015
US 1	Widen	4	6	VA 235 (Mt. Vernon Hwy) and VA 611	2020
US 1	Widen	4	6	Brady's Hill Road and VA 638	2025
US 15	Widen	2	4	I-66 and US 29	2040
US 29	Widen	4	6	City of Fairfax and Falls Church	2025
US 50	Widen	4	6	US 15 and VA 28	2015
US 50	Widen	4	6	City of Fairfax and Arlington County	2025
VA 7	Widen	4	6	Rolling Holly Dr. and Lewinsville Road	2030
VA 7	Widen	6	8	VA 267 and I-495	2030
VA 7 Bypass	Widen	4	6	US 15 (North) and US 15 (South)	2020
VA 28	Widen	6	8	I-66 and VA 7	2025
VA 123	Widen	4	6	Burke Center Pky and Braddock Road	2025
VA 236	Widen	4	6	Pickett Road and Braddock Road	2030
VA 411	Construct	0	4 - 6	US 50 and I-66	2035
VA 286	Add 2 HOV Lanes	4	6	VA 123 and VA 267	2035

Committed Transit Projects

- Crystal City/Potomac Yard Transitway
- Columbia Pike Streetcar
- Dulles Metrorail Silver Line, Phase I

George Washington Region

Inset: Super NoVa Study Area



Growth Areas

Residential

A. Ladysmith

Commercial

B. Boswell's Corner
C. Jackson Gateway

Mixed Use

D. Bowling Green
E. Carmel Church
F. Dahlgren
G. Fredericksburg
H. King George Courthouse
I. Southern Gateway
J. Stafford Courthouse

Figure 4.2: Comprehensive and Transportation Plans Summary – George Washington Region (GWRC)

GWRC and Fredericksburg Area Metropolitan Planning Organization (FAMPO)

Caroline, King George, Spotsylvania, and Stafford Counties and City of Fredericksburg

Population

Jurisdiction Name	State	2010 Population	2040 Population	Overall Growth	Overall Percentage Growth	Annual Growth
Caroline County*	VA	29,000	51,000	22,000	80%	2.0%
City of Fredericksburg#	VA	24,000	31,000	7,000	29%	0.9%
King George County*	VA	24,000	47,000	23,000	99%	2.3%
Spotsylvania County*	VA	122,000	270,000	148,000	121%	2.7%
Stafford County*	VA	129,000	269,000	140,000	109%	2.5%
Total		328,000	668,000	340,000	104%	2.4%

*Sources: * Jurisdiction Comprehensive Plan or Staff Projection # MWCOG Round 8.0 Forecasts*

Primary Transportations Corridors

Primary East-West Corridors

- US 17
- VA State Routes 3, 208, 218, and 610

Primary North-South Corridors

- I-95
- US 1 and 301
- VA State Routes 2 and 207

TDM Agency

- GW Ride Connect

Transit Service Providers

Stafford County

- Fredericksburg Regional Transit (FRED)
- Quick's, Martz
- VRE and Amtrak

Spotsylvania County

- FRED (Local Bus)
- Quick's and Martz (Commuter Bus)

Caroline and King George Counties

- FRED (Local Bus)

Mobility Issues

Existing

- I-95 operates at LOS E or worse from south of Fredericksburg to the Prince William County line
- Primary routes in the vicinity of the City of Fredericksburg operate at LOS E or F

Future (2040)

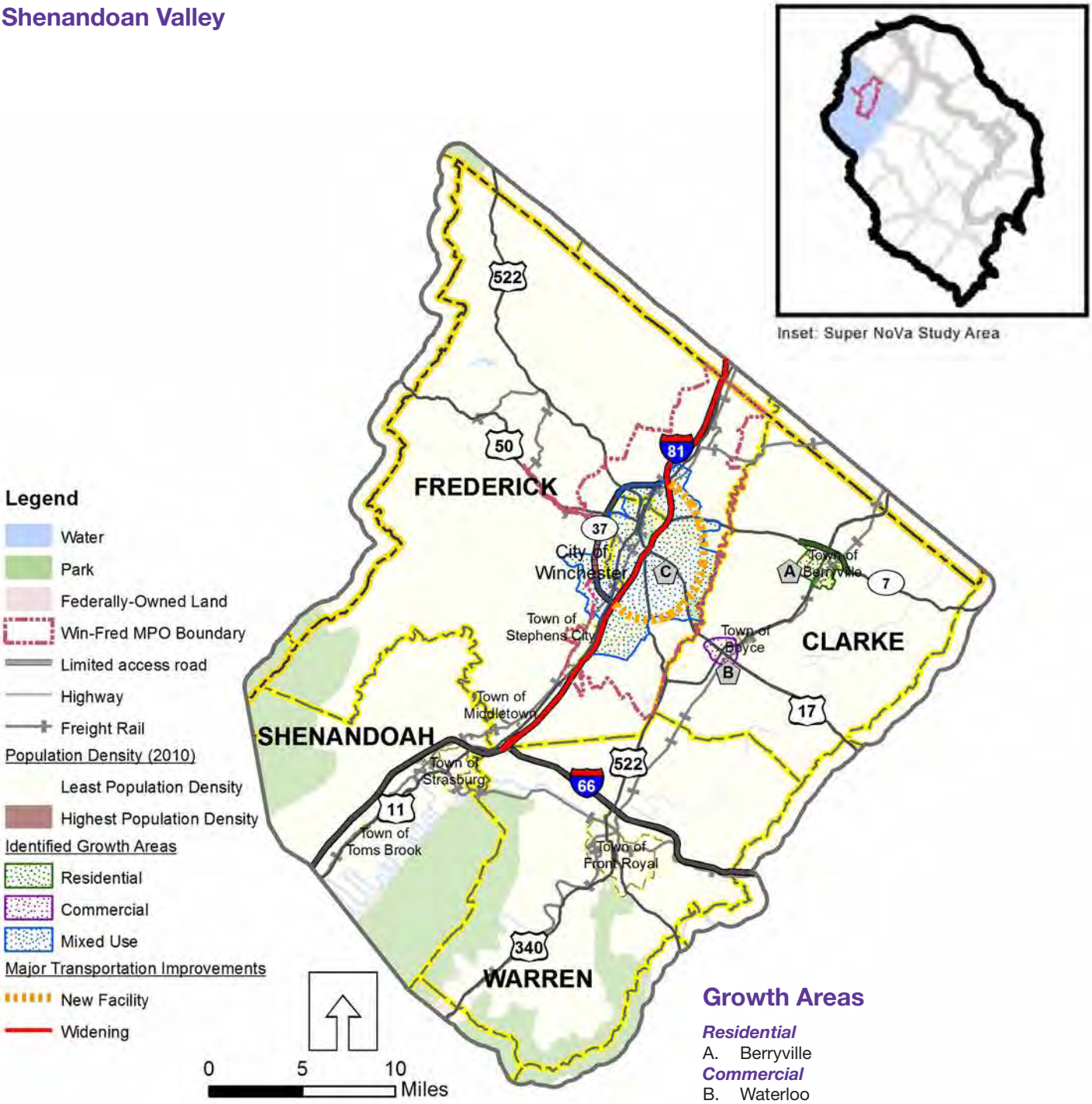
- Without improvements to I-95, US 1 and almost all primary routes operate at LOS E or worse
- With fiscally-constrained projects built, I-95 will operate at LOS F north of Fredericksburg and LOS E in Caroline County

Committed Roadway Projects

Facility	Improvement Type	Lanes		Limits	Year
		From	To		
I-95 HOT	Construct 2 HOT Lanes	0	2	Interchange #126 and Prince William County Line	2015
US 1	Widen	4	6	US 17 and Prince William County Line	2020
US 17	Widen	2	4	Tidewater Trail and I-95	2015
US 17	Widen	4	6	Berea Church Road and Hartwood Road	2030
—	Construct New Toll Road	0	4	I-95 and US 3, West of Fredericksburg	2020
VA 610	Widen	5	6	Shelton Shop Road and Onville Road	2035

Sources: 2035 George Washington Regional Long Range Transportation Plan, *Fredericksburg Area Metropolitan Planning Organization, January 2009;* Your Vision, Our Future: *The George Washington Regional Scenario Planning Study, George Washington Regional Commission, October 2010.*
Note: Individual jurisdiction comprehensive and transportation plans (where applicable) also were consulted.

Shenandoan Valley



Growth Areas

Residential
A. Berryville
Commercial
B. Waterloo
Mixed Use
C. Winchester

About one third of the population in the region will be located in the Win-Fred MPO area.

New development will be primarily limited to the expansion of existing towns and cities, especially Winchester.

Figure 4.3: Comprehensive and Transportation Plans Summary – Shenandoah Valley Subarea
Northern Shenandoah Valley Regional Commission (NSVRC) and Win-Fred Metropolitan Planning Organization (Win-Fred)
Clarke, Frederick, Shenandoah, and Warren Counties and City of Winchester

Population

Jurisdiction Name	State	2010 Population	2040 Population	Overall Growth	Overall Percentage Growth	Annual Growth
Frederick County*	VA	78,000	139,000	61,000	77%	1.9%
Warren County*	VA	38,000	63,000	25,000	68%	1.7%
Shenandoah County*	VA	42,000	53,000	11,000	26%	0.8%
City of Winchester*	VA	26,000	36,000	10,000	38%	1.1%
Clarke County*	VA	17,000	23,000	6,000	35%	1.0%
Total		304,000	417,000	113,000	37%	1.1%

*Source: * Jurisdiction Comprehensive Plan or Staff Projection*

Primary Transportations Corridors

Primary East-West Corridors

- I-66
- US Route 50
- VA State Route 7

Primary North-South Corridors

- I-95
- US Routes 1 and 301
- VA State Routes 2 and 207

TDM Agency

- NSVRC RideSmart

Transit Service Providers

Clarke County

- VRT Demand Response Service

Warren County

- Royal Trolley (FRAT)

Frederick County and Winchester

- WinTran

Mobility Issues

Existing

- I-66, I-81, US 340, and VA 7 throughout the region have operational deficiencies, especially in the vicinity of Winchester

Future (2040)

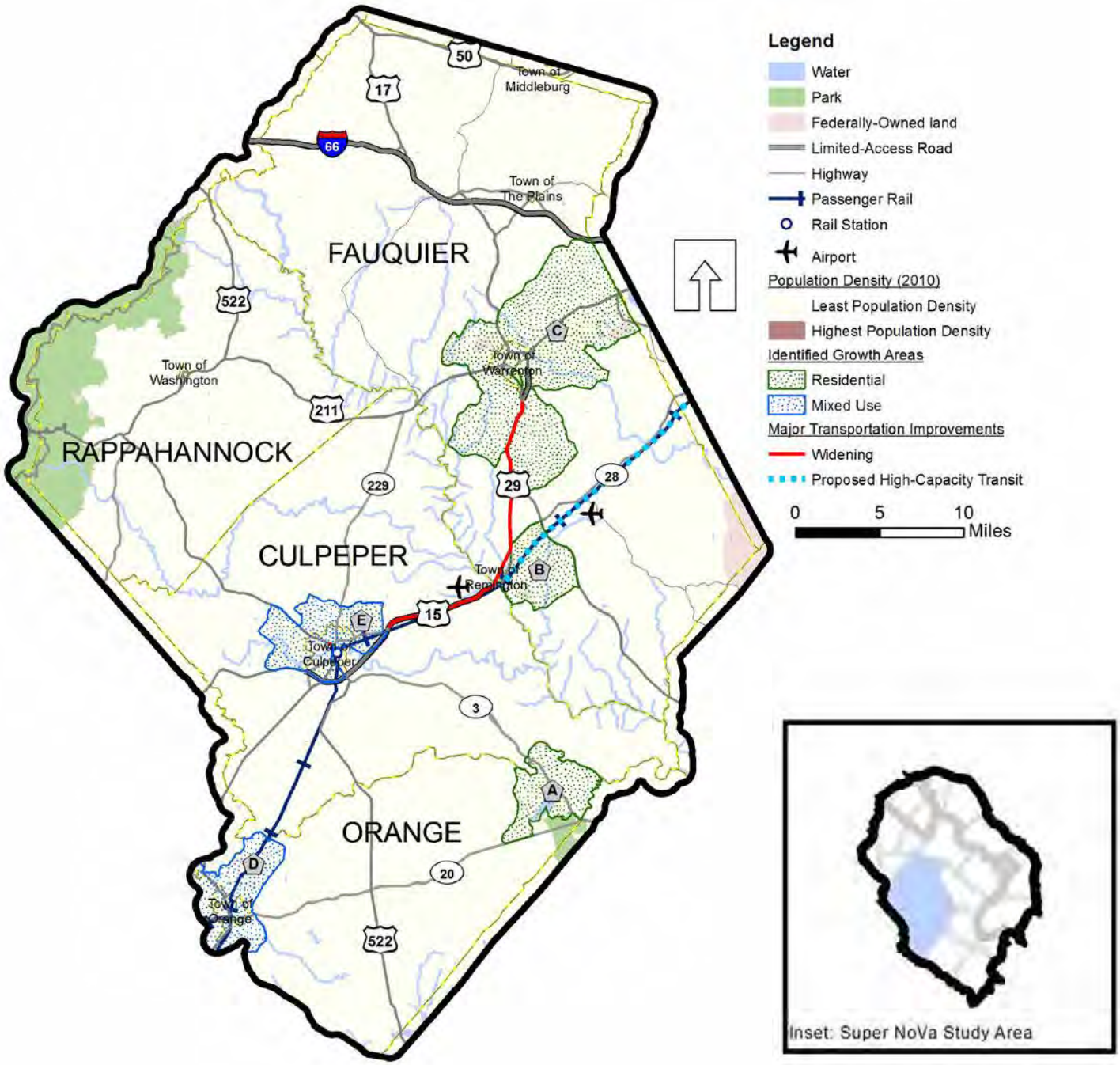
- Severe congestion will occur on major routes in and around the City of Winchester, especially on VA 7 and US 17/50

Committed Roadway Projects

Facility	Improvement Type	Lanes		Limits	Year
		From	To		
I-81	Widen	4	6	South MPO Boundary and Mile 310	2030
I-81	Construct Collector-Distributor	0	4	Mile 310 and Mile 313	2030
I-81	Widen	4	6	Mile 313 and North MPO Boundary	2030
VA 37	Complete Bypass	0	4	Around Winchester to the East	2030

Sources: Northern Shenandoah Valley Regional Commission 2035 Rural Long Range Transportation Plan, Northern Shenandoah Valley Regional Commission, *August 2011;* 2030 Transportation Plan, *Win-Fred Metropolitan Planning Organization, October 2005.*
Note: Individual jurisdiction comprehensive and transportation plans (where applicable) also were consulted.

Rappahannock-Rapidan Region



Growth Areas

Residential

A. Locust Grove
B. Remington-Bealton
C. Warrenton

Mixed Use

D. Orange
E. Culpeper

Figure 4.4: Comprehensive and Transportation Plans Summary – Rapidan Region

Rappahannock – Rapidan Regional Commission (RRRC)

Culpeper, Fauquier, Orange, and Rappahannock Counties

Population

Jurisdiction Name	State	2010 Population	2040 Population	Overall Growth	Overall Percentage Growth	Annual Growth
Culpeper County*	VA	47,000	98,000	51,000	109%	2.5%
Fauquier County*	VA	65,000	94,000	29,000	45%	1.2%
Orange County*	VA	33,000	62,000	29,000	87%	2.1%
Rappahannock County!	VA	7,000	10,000	3,000	36%	1.0%
Total		152,000	264,000	112,000	74%	1.9%

*Sources: * Jurisdiction Comprehensive Plan or Staff Projection ! Virginia Employment Commission*

Primary Transportations Corridors

Primary East-West Corridors

- I-66
- US Routes 50 and 211
- VA State Route 20

Primary North-South Corridors

- US Routes 15, 17, 29, and 522
- Virginia Routes 3, 28, 229, and 231

TDM Agency

- RRRC Commuter Services

Transit Service Providers

Fauquier County

- Circuit Rider (Warrenton)

Culpeper County

- Town of Culpeper Trolley
- Amtrak

Orange County

- Town of Orange Toot

Mobility Issues

Existing

- Heavy traffic congestion caused by through trips in the Towns of Culpeper and Warrenton
- Large amount of traffic growth on VA 3 and VA 20 north of the Town of Orange

Future (2040)

- Operational deficiencies on VA 229 between the Town of Culpepper and US 211
- Operational deficiencies on VA 20, west of the Town of Orange

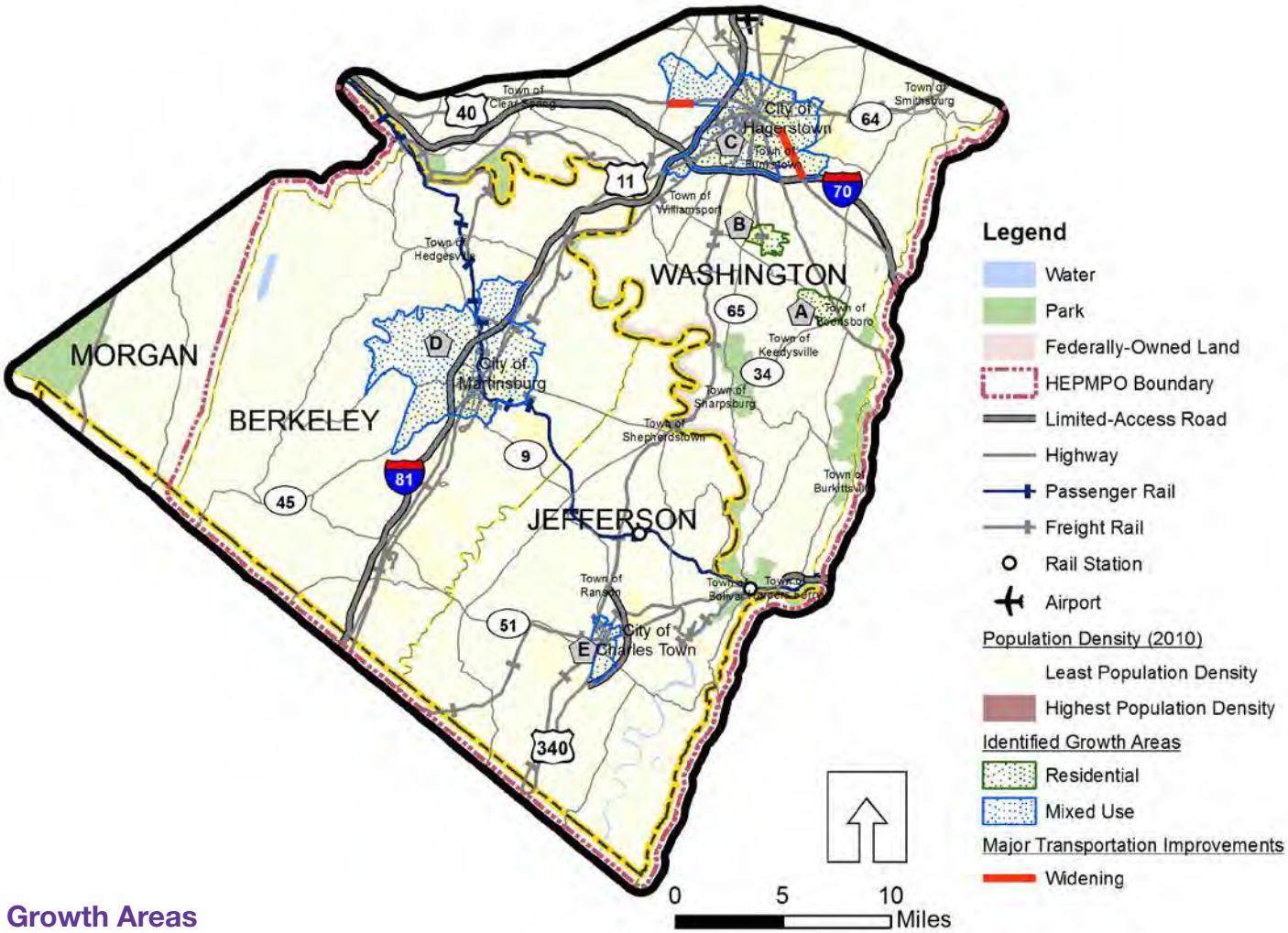
Committed Roadway Projects

Facility	Improvement Type	Lanes		Limits	Year
		From	To		
US 15	Widen	3	4	Montebello Road and VA 20	2035
US 15/29	Widen	2	4	VA 666 and VA 665	2035
VA 3	Widen	2	4	Stevensburg and Lingnum	2035
VA 3	Widen	2	4	S. Main Street and Southeastern Town of Culpeper Line	2035
VA 20	Widen	2	4	VA 15S and VA 612	2035
VA 28	Widen	2	3 -4	US 17 and US 15/29	2035

Sources: A Study of the Transportation and Land Use Planning Connection in the Rappahannock-Rapidan Region, *Rappahannock-Rapidan Regional Commission (RRRC), July 2005;* Rappahannock-Rapidan Regional Commission 2035 Long Range Transportation Plan, RRRC, *June 2011;* Rappahannock-Rapidan Regional Commission Congestion Management System Plan, *RRRC, May 2008.*
Note: Individual jurisdiction comprehensive and transportation plans (where applicable) also were consulted.

Hagerstown/Eastern Panhandle

Inset: Super NoVa Study Area



Growth Areas

Residential

A. St. James
B. Boonsboro

Mixed Use

C. Hagerstown
D. Martinsburg
E. Ranson-Charles Town

Figure 4.5: Comprehensive and Transportation Plans Summary – Hagerstown/Eastern Panhandle

Easter Panhandle Regional Planning and Development Council and Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO)

Counties of Berkley (WV), Jefferson (WV), and Washington (MD)

Population

Jurisdiction Name	State	2010 Population	2040 Population	Overall Growth	Overall Percentage Growth	Annual Growth
Berkeley County*	WV	104,000	129,000	25,000	24%	0.7%
Jefferson County*	WV	53,000	86,000	33,000	61%	1.6%
Washington County!	MD	147,000	202,000	55,000	37%	1.1%
Total		304,000	417,000	113,000	37%	1.1%

*Sources: * Jurisdiction Comprehensive Plan or Staff Projection ! Virginia Employment Commission*

Primary Transportations Corridors

Primary East-West Corridors

- I-70
- US Route 40
- MD State Routes 34 and 64
- WV State Routes 45 and 51

Primary North-South Corridors

- I-81
- US Routes 11 and 340
- MD State Route 65
- WV State Routes 9 and 25

Transit Service Providers

Berkeley and Jefferson Counties

- PanTran
- Amtrak

Washington County

- County Commuter
- Maryland Transit Administration (MTA) Commuter Bus
- Metrorail, MARC, and Amtrak

Mobility Issues

Existing

- I-81 and I-70 has heavy congestion with more than 40,000 annual average daily traffic (AADT)
- US 40, US 340, MD 65, and WV 9 have mild congestion with AADT between 20,000 and 40,000
- Eighteen percent of lane miles in urbanized areas are deficient (LOS E or F)

Future (2040)

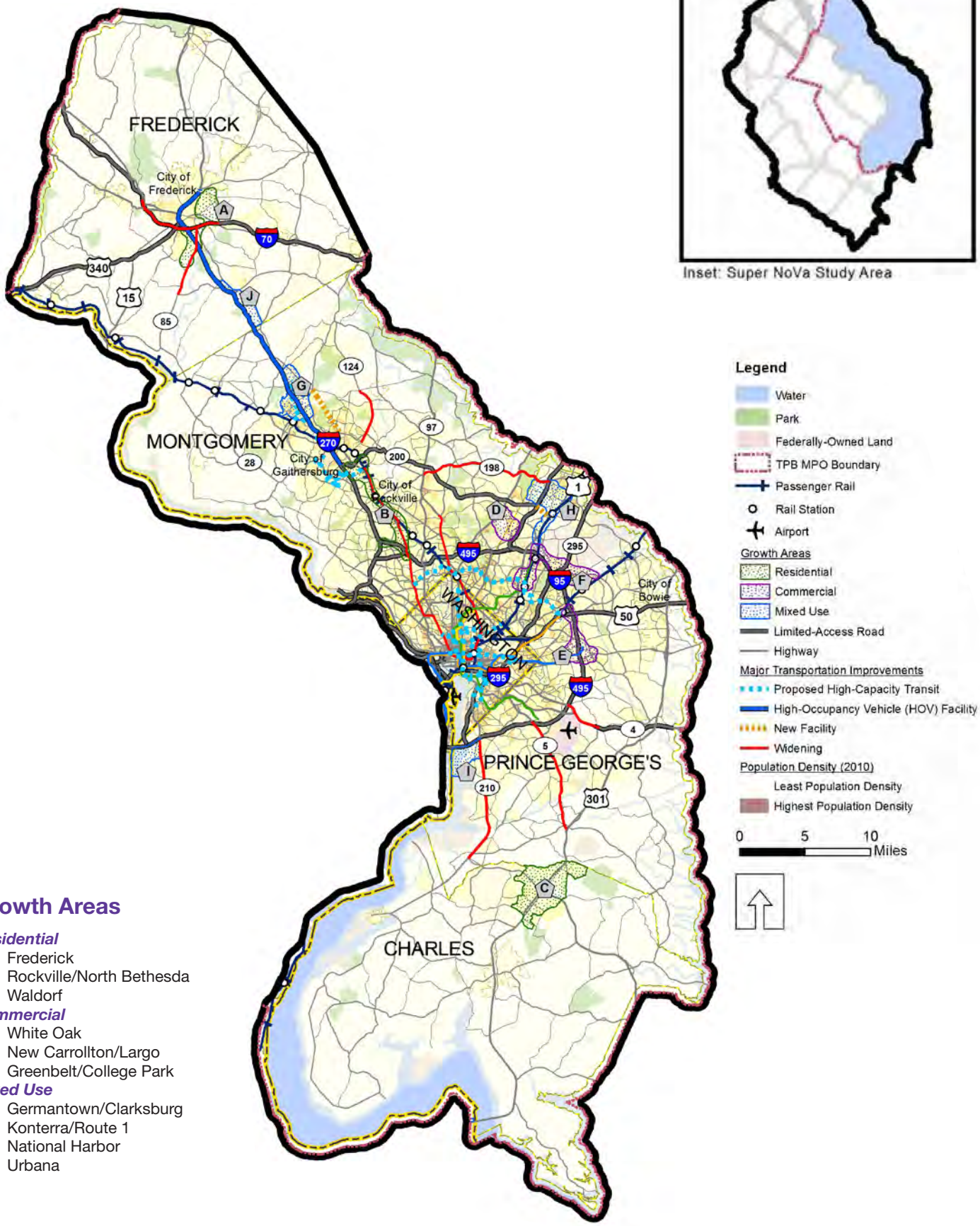
- Regional vehicle miles traveled increases by 40 percent (28 percent on freeways, 53 percent on arterials, and 57 percent on local roads)
- Regional delay increases by 175 percent (278 percent on freeways, 137 percent on arterials, and 180 percent on local roads)
- Twenty-seven percent of lane miles in urbanized areas will be deficient (LOS E or F)

Committed Roadway Projects

Facility	Improvement Type	Lanes		Limits	Year
		From	To		
US 11	Widen	2	4	Burhans Boulevard and Terminal Drive	2035
US 11	Widen	2	4	Tabler Station Road and WV 45/9	2035
US 40	Widen	2	4	MD 63 and MD 144	2035
US 40	Widen	4	6	I-70 Interchange and Eastern Boulevard	2035
WV 9	Widen	4	6	I-81 and Industrial Park	2025

Sources: Direction 2035: A Regional Framework for a Safe and Efficient Multimodal Transportation Network, *Hagerstown/Eastern Panhandle Metropolitan Planning Organization, June 2010;* Comprehensive Economic Development Strategy 2009-2013, *Eastern Panhandle Regional Planning and Development Council, August 2012.*
Note: Individual jurisdiction comprehensive and transportation plans (where applicable) also were consulted.

Metropolitan Washington (Maryland)



Growth Areas

Residential

A. Frederick
B. Rockville/North Bethesda
C. Waldorf

Commercial

D. White Oak
E. New Carrollton/Largo
F. Greenbelt/College Park

Mixed Use

G. Germantown/Clarksburg
H. Konterra/Route 1
I. National Harbor
J. Urbana

Figure 4.6: Comprehensive and Transportation Plans Summary – Maryland Subarea

MWCOG and National Capital Region TPB

Counties of Charles, Frederick (MD), Montgomery, and Prince George's

Population

Jurisdiction Name	State	2010 Population	2040 Population	Overall Growth	Overall Percentage Growth	Annual Growth
Charles County$	MD	147,000	222,000	75,000	51%	1.4%
Frederick County$	MD	233,000	364,000	131,000	56%	1.5%
Montgomery County$	MD	972,000	1,199,000	227,000	23%	0.7%
Prince George's County$	MD	863,000	945,000	82,000	9%	0.3%
Total		1,835,000	2,144,000	309,000	17%	0.5%

Source: $ Maryland State Data Center

Primary Transportations Corridors

Primary East-West Corridors

- I-70 and I-370
- US Route 50
- MD Routes 4, 28, and 200

Primary North-South Corridors

- I-95, I-270, I-295, and I-495
- US Routes 1 and 301
- MD State Routes 5, 85, 97, 124, and 295

TDM Agencies

- Frederick County Commuter Services
- Montgomery County Commuter Services
- Prince George's County (RideSmart)
- Tri-County Council for Southern Maryland

Transit Service Providers

Charles County

- VanGo
- MTA Commuter Bus

Frederick County

- TransIT
- MTA Commuter Bus
- MARC and Amtrak

Montgomery County

- Ride-On
- WMATA Metrobus
- MTA Commuter Bus

Prince George's County

- TheBus
- WMATA Metrobus
- MTA Commuter Bus
- Metrorail, MARC, and Amtrak

Mobility Issues

Existing

- During the a.m. peak period, there is severe congestion (LOS E or worse) on I-495 between I-270 and I-95 and near the interchange of US 50 and MD-295
- During the p.m. peak period, there is severe congestion (LOS E or worse) in both directions throughout Montgomery County and north of US 50 in Prince George's County
- I-270 is severely congested (LOS E or worse) in the peak direction in both the a.m. and p.m. peak periods

2040

- Congestion on MD 295 worsens
- The proposed HOV or HOT lanes on I-270 alleviate some congestion
- Overall vehicle miles traveled will increase by 22 percent between 2010 to 2040
- Lane-miles of congestion will increase by 38 percent by 2040

Committed Roadway Projects

Facility	Improvement Type	Lanes From	Lanes To	Limits	Year
I-70	Widen	4	6	MD 144 and Mt. Phillip Road	2020
I-270/ US 15 Corridor	Widen and Add HOV or HOT Lanes	-	-	Shady Grove Metro and Biggs Ford Road	2030
MD 4	Widen	6	8	I-495 and MD 223	2035
MD 5	Widen	6	8	I-495 and US 301	2035
MD 28/198	Widen	2/4	4/6	MD 97 and I-95	2025
M 83	Construct	0	4	Gaithersburg and Clarksville	2020
MD 85	Widen	2/4	4/6	Westview Development to Grove Road	2020
MD 124	Widen	2	6	Midcounty Highway to Warfield Road	2020
MD 200	Construct	0	6	I-95 and US 1	2015
MD 210	Widen	6	8	I-495 and Berry Road	2030

Committed Transit Projects

- Purple Line
- Corridor Cities Transitway

Sources: 2010 Congestion Management Process Technical Report, *National Capital Region Transportation Planning Board, September 2010;* The Financially Constrained Long-Range Transportation Plan for the National Capital Region, *National Capital Regional Transportation Planning Board, November 2010;* Metropolitan Washington Regional Activity Centers and Clusters, *Metropolitan Washington Coalition of Governments, April 2007.*
Note: Individual jurisdiction comprehensive and transportation plans (where applicable) also were consulted.

Table 4.1: 2040 Population by Jurisdiction

Jurisdiction Name	2010 Census Population	2040 Forecast Population	Annual Growth Percentage
Arlington County, VA[2]	208,000	252,000	0.6%
Berkeley County, WV[1]	104,000	129,000	0.7%
Caroline County, VA[1]	29,000	51,000	2.0%
Charles County, MD[3]	147,000	222,000	1.4%
City of Alexandria, VA[2]	140,000	188,000	1.0%
City of Fairfax, VA[1]	23,000	27,000	0.6%
City of Falls Church, VA[1]	12,000	17,000	1.1%
City of Fredericksburg, VA[2]	24,000	31,000	0.9%
City of Manassas Park, VA[1]	14,000	21,000	1.4%
City of Manassas, VA [4]	38,000	54,000	1.2%
City of Winchester, VA[1]	26,000	36,000	1.1%
Clarke County, VA[1]	17,000	23,000	1.0%
Culpeper County, VA[1]	47,000	98,000	2.5%
Fairfax County, VA[2]	1,082,000	1,281,000	0.6%
Fauquier County, VA[1]	65,000	94,000	1.2%
Frederick County, MD[3]	233,000*	364,000*	1.5%
Frederick County, VA[1]	78,000	139,000	1.9%
Jefferson County, WV[1]	53,000	86,000	1.6%
King George County, VA[1]	24,000	47,000	2.3%
Loudoun County, VA[2]	312,000	440,000	1.1%
Montgomery County, MD[3]	972,000	1,199,000	0.7%
Orange County, VA[1]	33,000*	62,000*	2.1%
Prince George's County, MD[3]	863,000	945,000	0.3%
Prince William County, VA[2]	402,000	564,000	1.1%
Rappahannock County, VA[4]	7,000	10,000	1.0%
Shenandoah County, VA[1]	42,000*	53,000*	0.8%
Spotsylvania County, VA[1]	122,000	270,000	2.7%
Stafford County, VA[1]	129,000	269,000	2.5%
Warren County, VA[1]	38,000	63,000	1.7%
Washington County, MD[4]	147,000*	202,000*	1.1%
Washington, D.C.[2]	602,000	761,000	0.8%
TOTAL	**6,033,000**	**7,998,000**	**0.9%**

*Entire county is not located within the Super NoVa region. Population reflects entire county.

2010 Source: US Census Bureau – 2010 Census

2040 Sources:

[1] Jurisdiction Comprehensive Plan or staff

[2] MWCOG Round 8.0 Forecasts

[3] Maryland State Data Center

[4] Virginia Employment Commission

FUTURE POPULATION AND EMPLOYMENT

Bicycle parking at East Falls Church Metrorail station.

The Super NoVa region is continually growing and is one of the largest metropolitan areas in the country. This section describes the forecast population, employment, and activity conditions forecast for 2040.

POPULATION

Population and employment forecasts used in the Super NoVa study were developed by the following regional planning agencies[1] with input from local jurisdictions:

- MWCOG
- GWRC
- WinFred MPO
- HEPMPO

For jurisdictions that are not part of a metropolitan planning organization, forecasts obtained from comprehensive plans or jurisdictional staff were used.

By the year 2040, the population of the Super NoVa region is forecast to grow to approximately 8 million people. This represents an increase of approximately 2 million people, or 35 percent of the 2010 population. Population by jurisdiction is shown in **Table 4.1** on the preceding page.

Growth in population will occur in existing residential areas and spread to new areas. While the densest areas are still located in the region's inner area, population is forecast to spread further into the suburbs. **Figure 4.7** and **Figure 4.8** show the forecast 2040 population density for the entire Super NoVa region and the inner area, respectively.

The change in population between 2010 and 2040 highlights areas with increased population that may need new or increased transit service. In addition to growth in the inner area and along major commuting corridors, a pronounced increase in growth is forecast to occur in many parts of outer suburbs, such as eastern Loudoun and Prince William Counties. In the more rural areas of the region, growth is more concentrated to areas that have existing development. **Figure 4.9** and **Figure 4.10** show the forecast change in population density from 2010 to 2040 (people per square mile) for the Super NoVa region and inner area, respectively.

1 TAZ data was obtained from the following metropolitan planning organizations (MPO): Metropolitan Washington Council of Governments (MWCOG), Fredericksburg Area MPO, Win-Fred County MPO, and Hagerstown/Eastern Panhandle MPO. Where models overlapped, the MWCOG model was used.

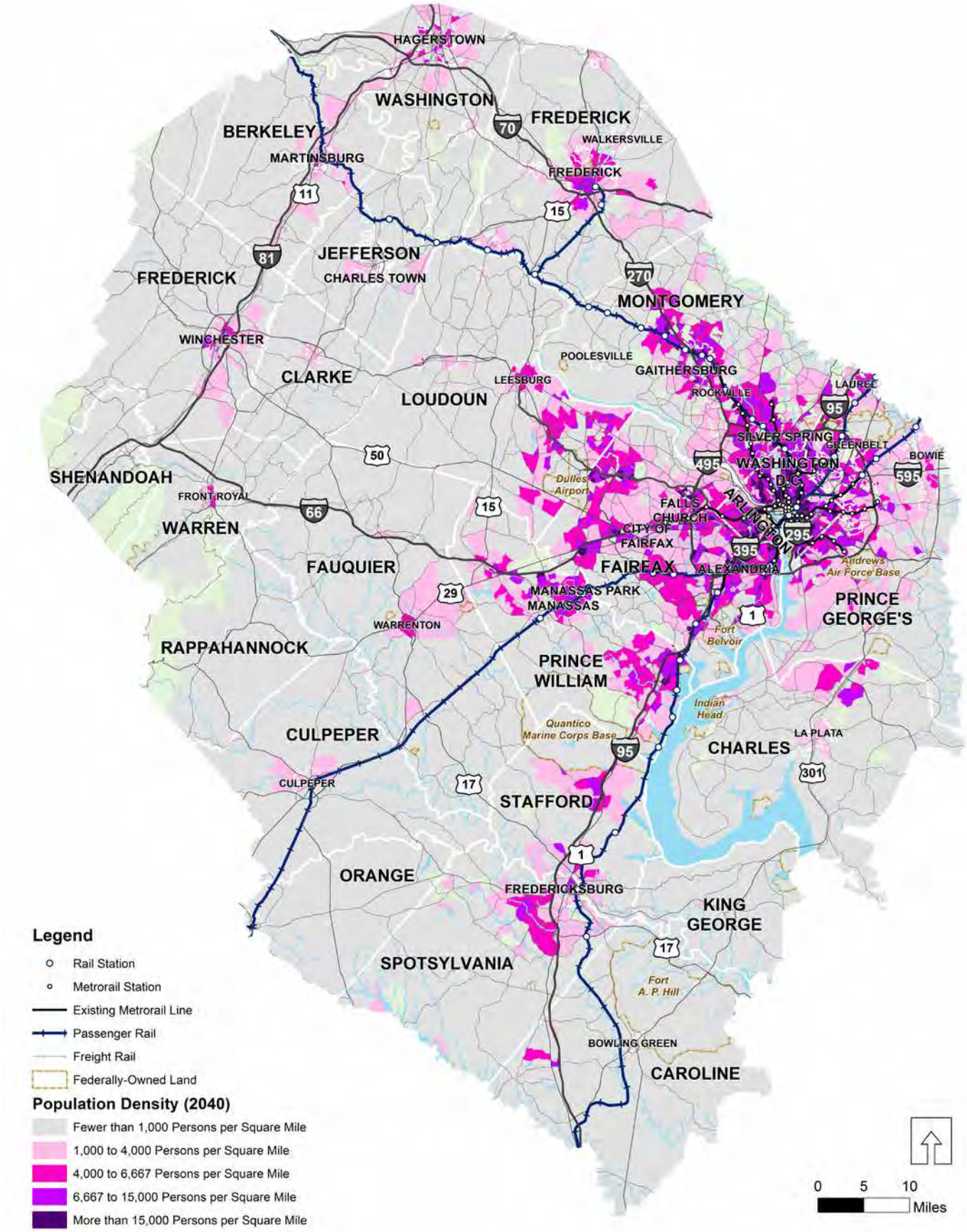


Figure 4.7: 2040 Population Density

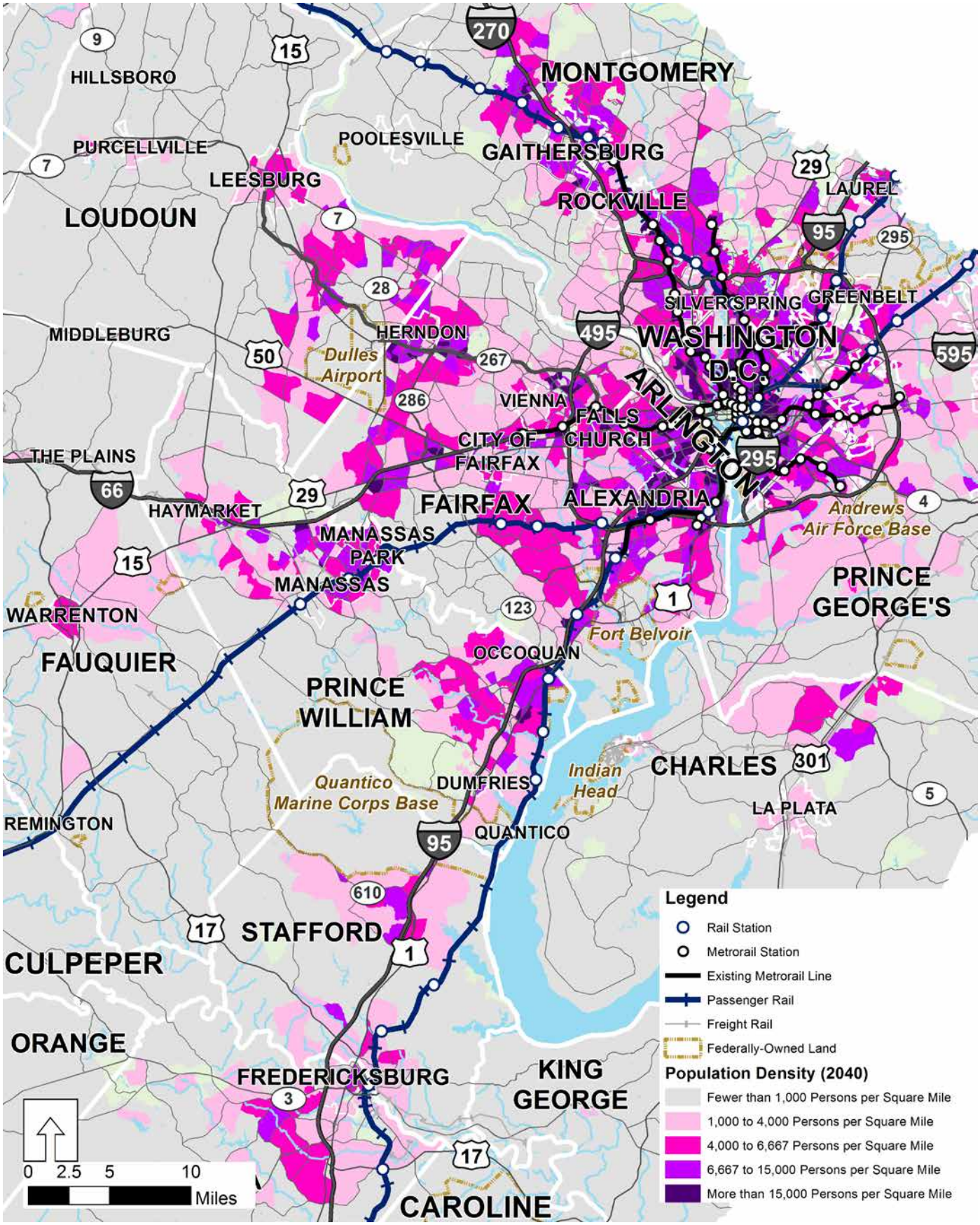


Figure 4.8: 2040 Population Density – Inner Area

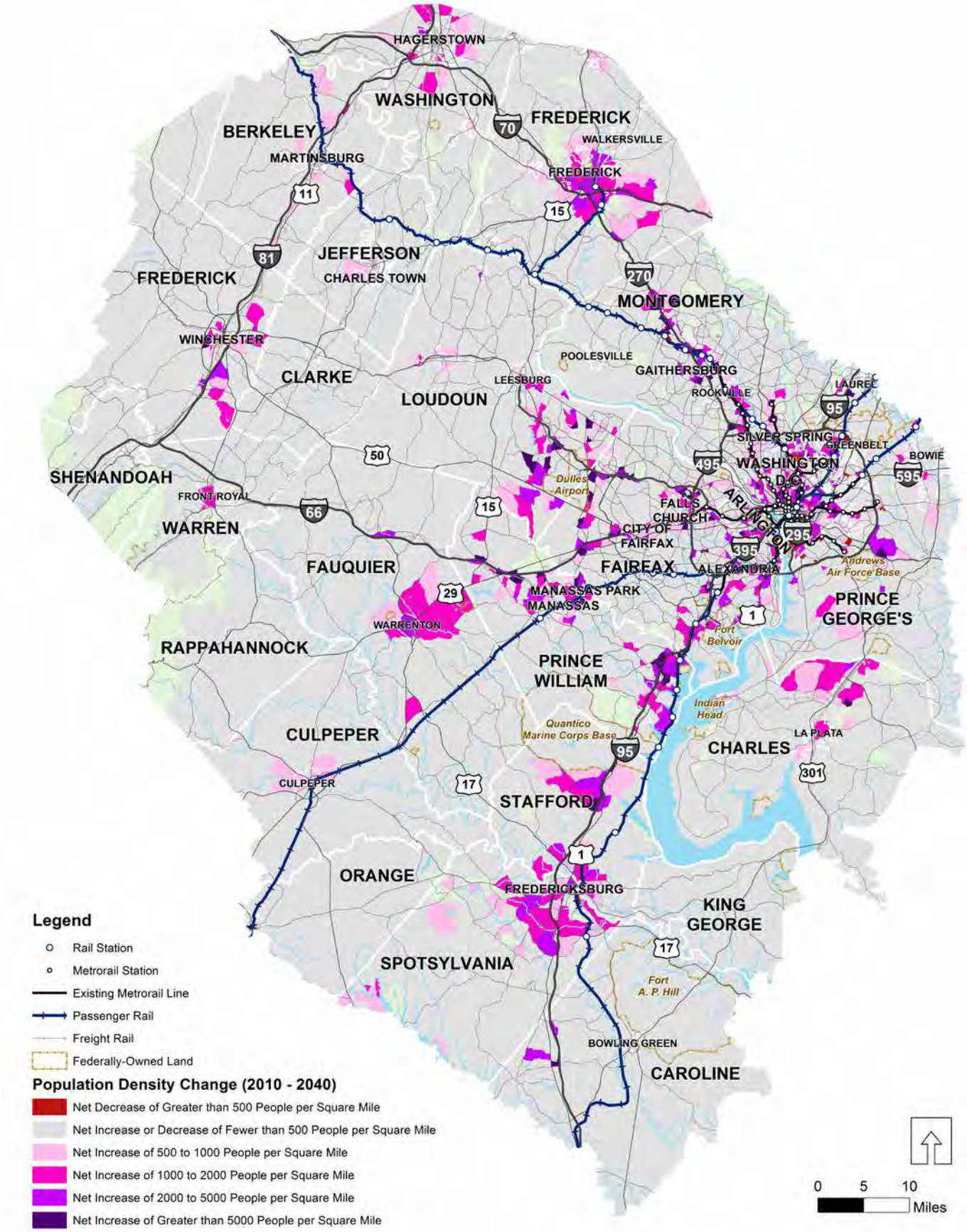


Figure 4.9: Change in Population Density (2010 to 2040)

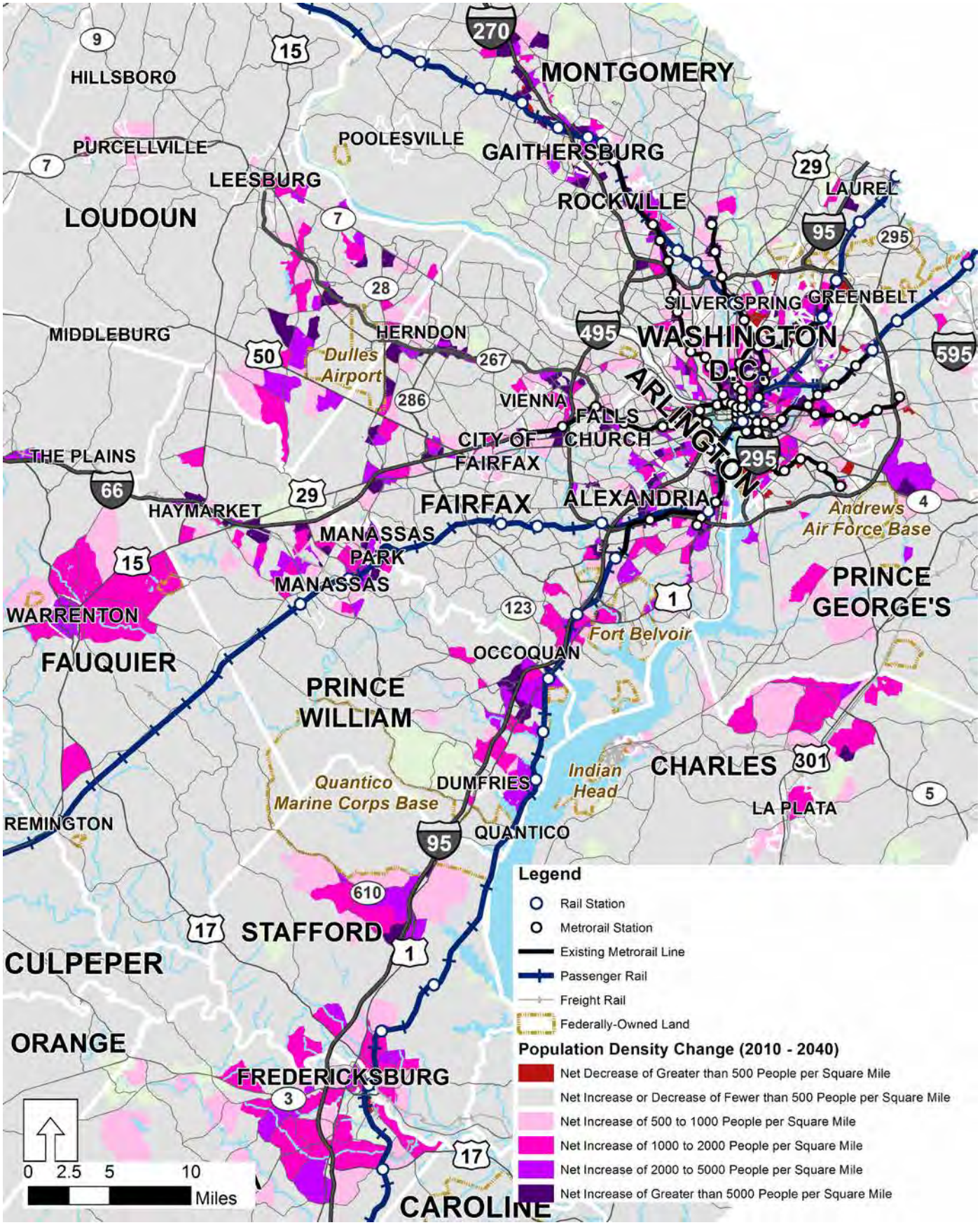


Figure 4.10: Change in Population Density – Inner Area (2010 to 2040)

EMPLOYMENT

For the purposes of the Super NoVa study, employment refers to the number of people whose jobs are located in the jurisdiction. Employment by jurisdiction is shown in **Table 4.2** on the following page. Employment forecasts used in the Super NoVa study relied on data provided by metropolitan planning agencies. For jurisdictions that are not part of a MPO, Virginia Employment Commission (VEC)-projected regional employment growth rates were applied.

Employment in 2040 is forecast to grow to approximately 5 million jobs. This represents an increase of about 1.5 million jobs, or 41 percent of the 2010 employment estimate. Major employment centers today remain the most concentrated areas of employment. **Figure 4.11** and **Figure 4.12** show the forecast 2040 employment density for the Super NoVa region and inner area, respectively.

Analysis of the forecast change in employment highlights significant employment growth throughout the region. **Figure 4.13** and **Figure 4.14** show the forecast change in employment density from 2010 to 2040 (employees per square mile) for the Super NoVa region and inner area, respectively.

Table 4.2: 2040 Employment by Jurisdiction

Jurisdiction Name	2010 Employment	2040 Employment	Annual Growth Percentage
Arlington County, VA	205,000	281,000	1.1%
Berkeley County, WV	44,000	63,000	1.2%
Caroline County, VA	7,000	16,000	2.7%
Charles County, MD	62,000	83,000	1.0%
City of Alexandria, VA	109,000	160,000	1.3%
City of Fairfax, VA	27,000	38,000	1.1%
City of Falls Church, VA	11,000	18,000	1.6%
City of Fredericksburg, VA	28,000	46,000	1.6%
City of Manassas Park, VA	5,000	5,000	0.4%
City of Manassas, VA	25,000	35,000	1.2%
City of Winchester, VA	30,000	43,000	1.2%
Clarke County, VA	5,000	7,000	1.1%
Culpeper County, VA	14,000	22,000	1.3%
Fairfax County, VA	641,000	862,000	1.0%
Fauquier County, VA	22,000	43,000	2.2%
Frederick County, MD	139,000	171,000	0.7%
Frederick County, VA	24,000	37,000	1.5%
Jefferson County, WV	17,000	29,000	1.8%
King George County, VA	9,000	19,000	2.6%
Loudoun County, VA	144,000	285,000	2.3%
Montgomery County, MD	506,000	723,000	1.2%
Orange County, VA	8,000	12,000	1.3%
Prince George's County, MD	358,000	475,000	0.9%
Prince William County, VA	114,000	238,000	2.5%
Rappahannock County, VA	1,000	2,000	1.3%
Shenandoah County, VA	13,000	18,000	1.1%
Spotsylvania County, VA	38,000	67,000	1.9%
Stafford County, VA	42,000	74,000	1.9%
Warren County, VA	11,000	16,000	1.1%
Washington County, MD	79,000	91,000	0.5%
Washington, D.C.	786,000	976,000	0.7%
TOTAL	**3,524,000**	**4,955,000**	**1.1%**

Sources: Regional Travel Demand Models (MWCOG, FAMPO, Win-Fred, HEPMPO); Virginia Employment Commission.

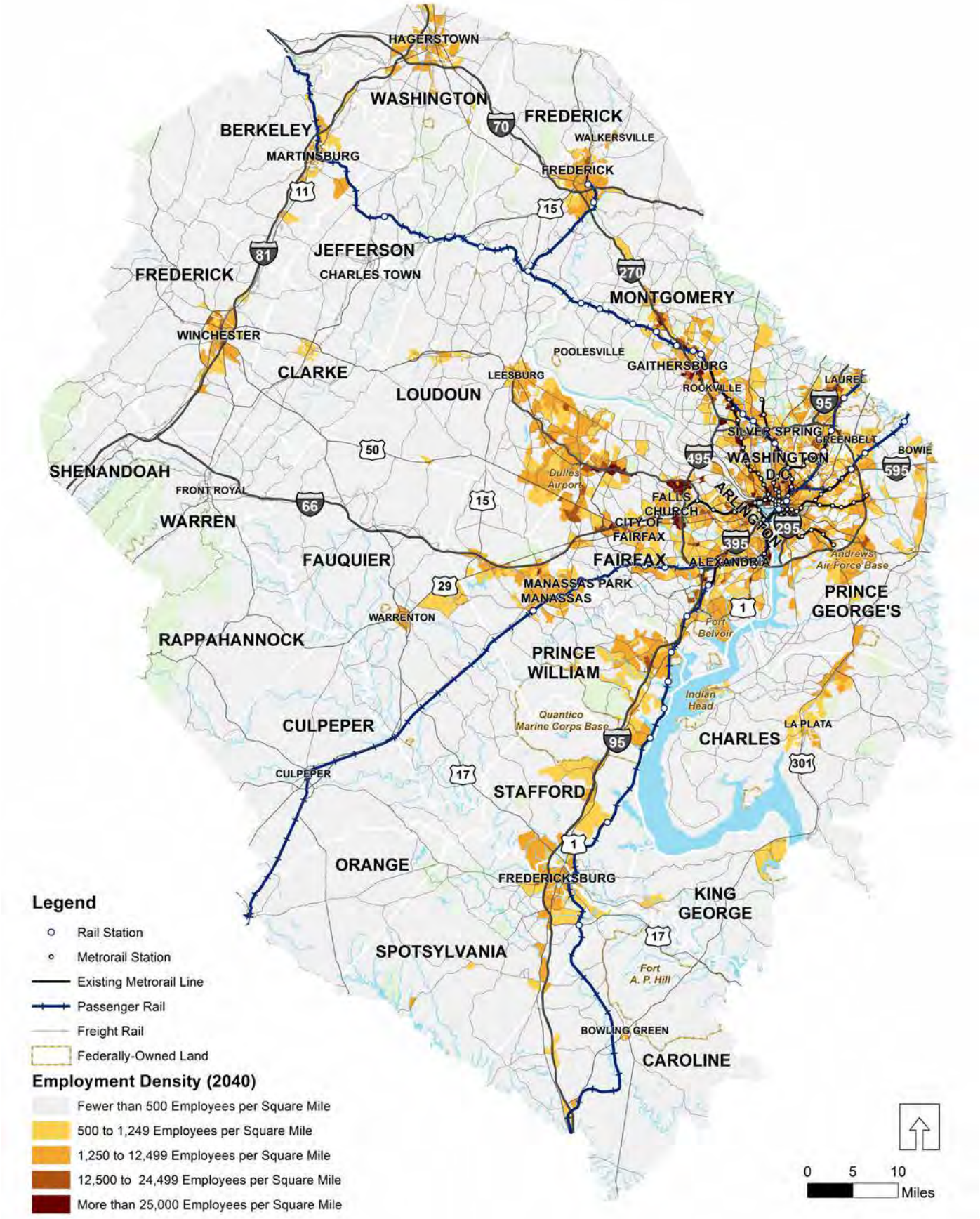


Figure 4.11: 2040 Employment Density

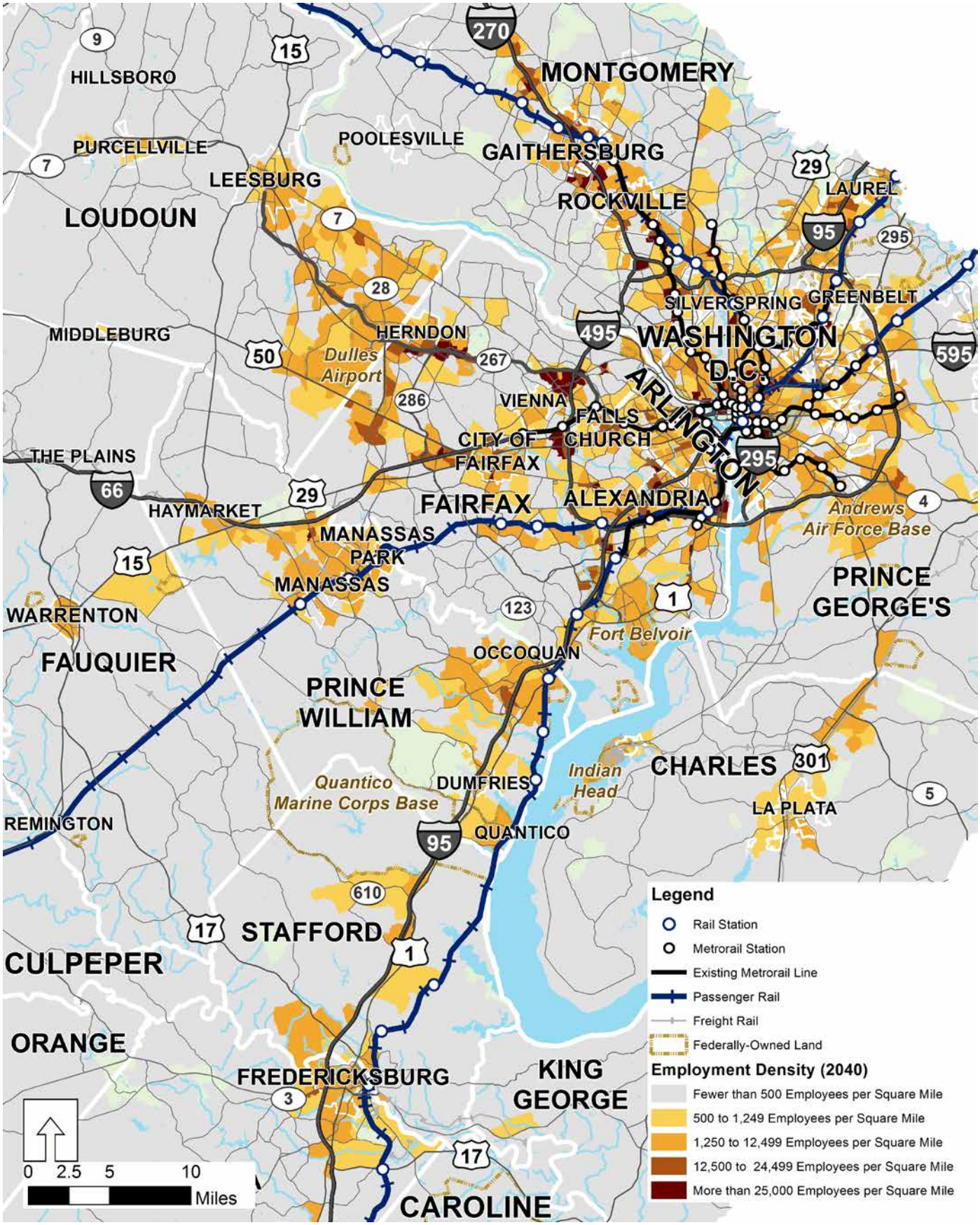


Figure 4.12: 2040 Employment Density – Inner Area

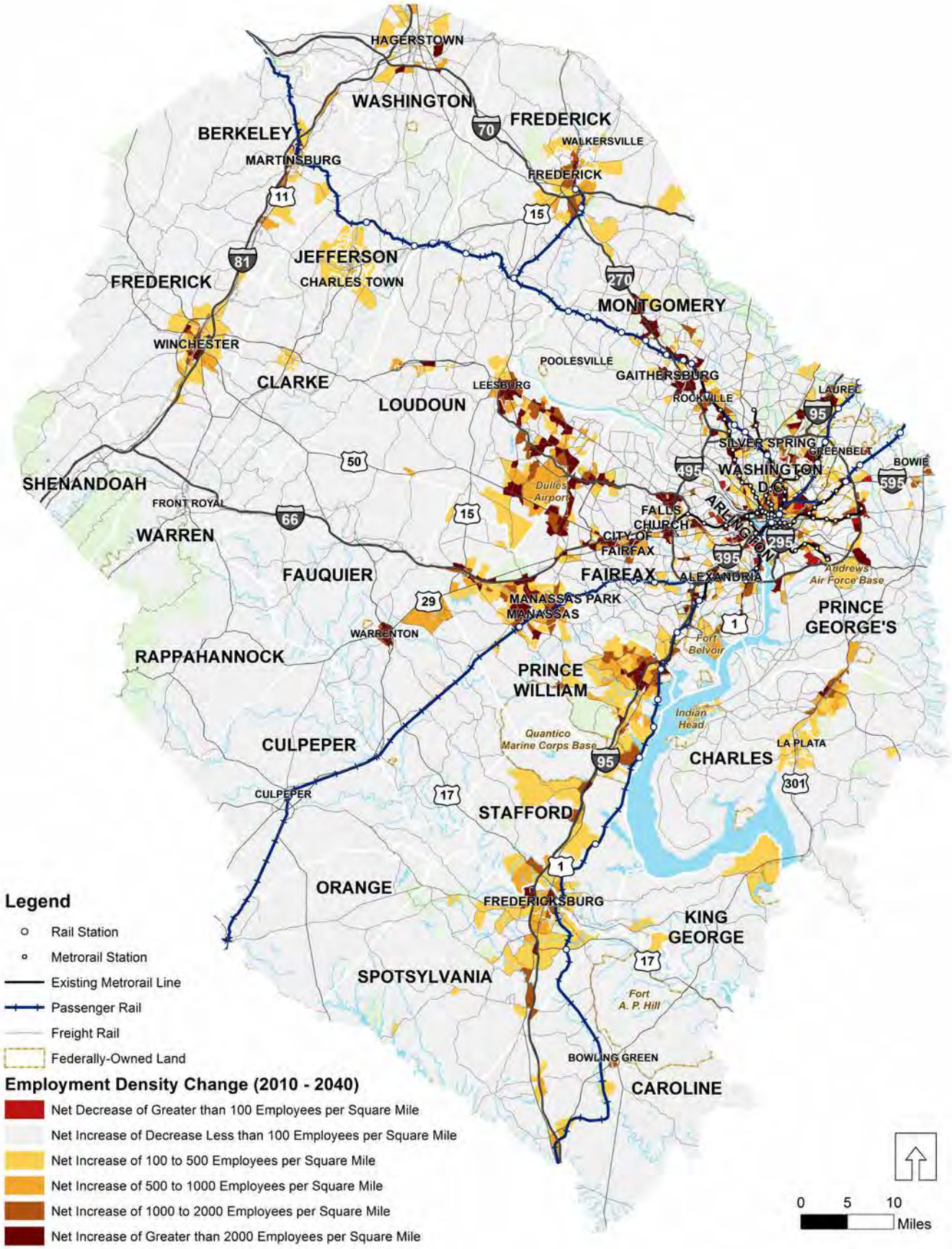


Figure 4.13: Change in Employment Density (2010 to 2040)

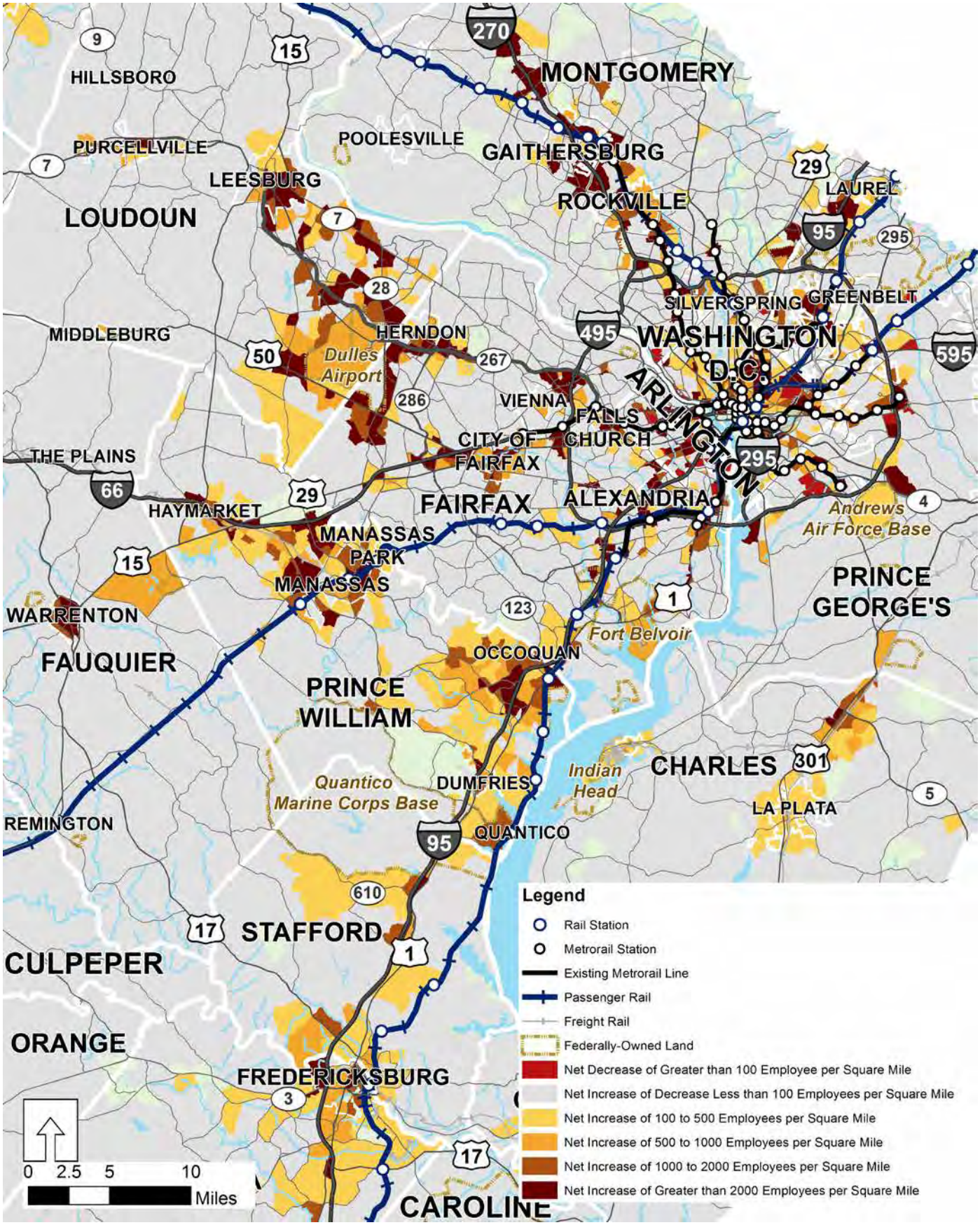


Figure 4.14: Change in Employment Density – Inner Area (2010 to 2040)

ACTIVITY

Population and employment forecasts were combined to create activity forecasts for 2040. **Table 4.3** shows activity by jurisdiction.

By 2040, the region is forecast to have 2.45 jobs and people per acre, or a 37 percent increase from the 2010 activity density. The majority of the activity of the region remains close to the region's inner area. As distances increase from the inner area, activity is primarily concentrated in centers. **Figure 4.15** and **Figure 4.16** show the forecast 2040 activity density in jobs and people per acre for the Super NoVa region and inner area, respectively.

Change in activity density is forecast to be most pronounced along the major commuting corridors and in existing employment centers. Forecasted increases in population and employment will expand the urbanized inner part of the region through Fairfax County and into portions of Prince William County and eastern Loudoun County. **Figure 4.17** and **Figure 4.18** show the forecast change in activity density from 2010 to 2040 (jobs and people per acre) for the Super NoVa region and inner area, respectively.

Table 4.3: 2040 Activity by Jurisdiction

Jurisdiction Name	2010 Activity	2040 Activity	Annual Growth Percentage
Arlington County, VA	413,000	533,000	0.9%
Berkeley County, WV	148,000	192,000	0.9%
Caroline County, VA	36,000	67,000	2.1%
Charles County, MD	209,000	305,000	1.3%
City of Alexandria, VA	249,000	348,000	1.1%
City of Fairfax, VA	50,000	65,000	0.9%
City of Falls Church, VA	23,000	35,000	1.4%
City of Fredericksburg, VA	52,000	77,000	1.3%
City of Manassas Park, VA	19,000	26,000	1.1%
City of Manassas, VA	63,000	89,000	1.2%
City of Winchester, VA	56,000	79,000	1.2%
Clarke County, VA	22,000	30,000	1.0%
Culpeper County, VA	61,000	120,000	2.3%
Fairfax County, VA	1,723,000	2,143,000	0.7%
Fauquier County, VA	87,000	137,000	1.5%
Frederick County, MD	372,000	535,000	1.2%
Frederick County, VA	102,000	176,000	1.8%
Jefferson County, WV	70,000	115,000	1.7%
King George County, VA	33,000	66,000	2.3%
Loudoun County, VA	456,000	725,000	1.6%
Montgomery County, MD	1,478,000	1,922,000	0.9%
Orange County, VA	41,000	74,000	2.0%
Prince George's County, MD	1,221,000	1,420,000	0.5%
Prince William County, VA	516,000	802,000	1.5%
Rappahannock County, VA	8,000	12,000	1.4%
Shenandoah County, VA	55,000	71,000	0.9%
Spotsylvania County, VA	160,000	337,000	2.5%
Stafford County, VA	171,000	343,000	2.3%
Warren County, VA	49,000	79,000	1.6%
Washington County, MD	226,000	293,000	0.9%
Washington, D.C.	1,388,000	1,737,000	0.8%
TOTAL	**9,557,000**	**12,953,000**	**1.0%**

Sources: Regional Travel Demand Models (MWCOG, FAMPO, Win-Fred, and HEPMPO); US Census Bureau; Virginia Employment Commission; Jurisdiction Comprehensive Plan or Staff; Maryland State Data Center.

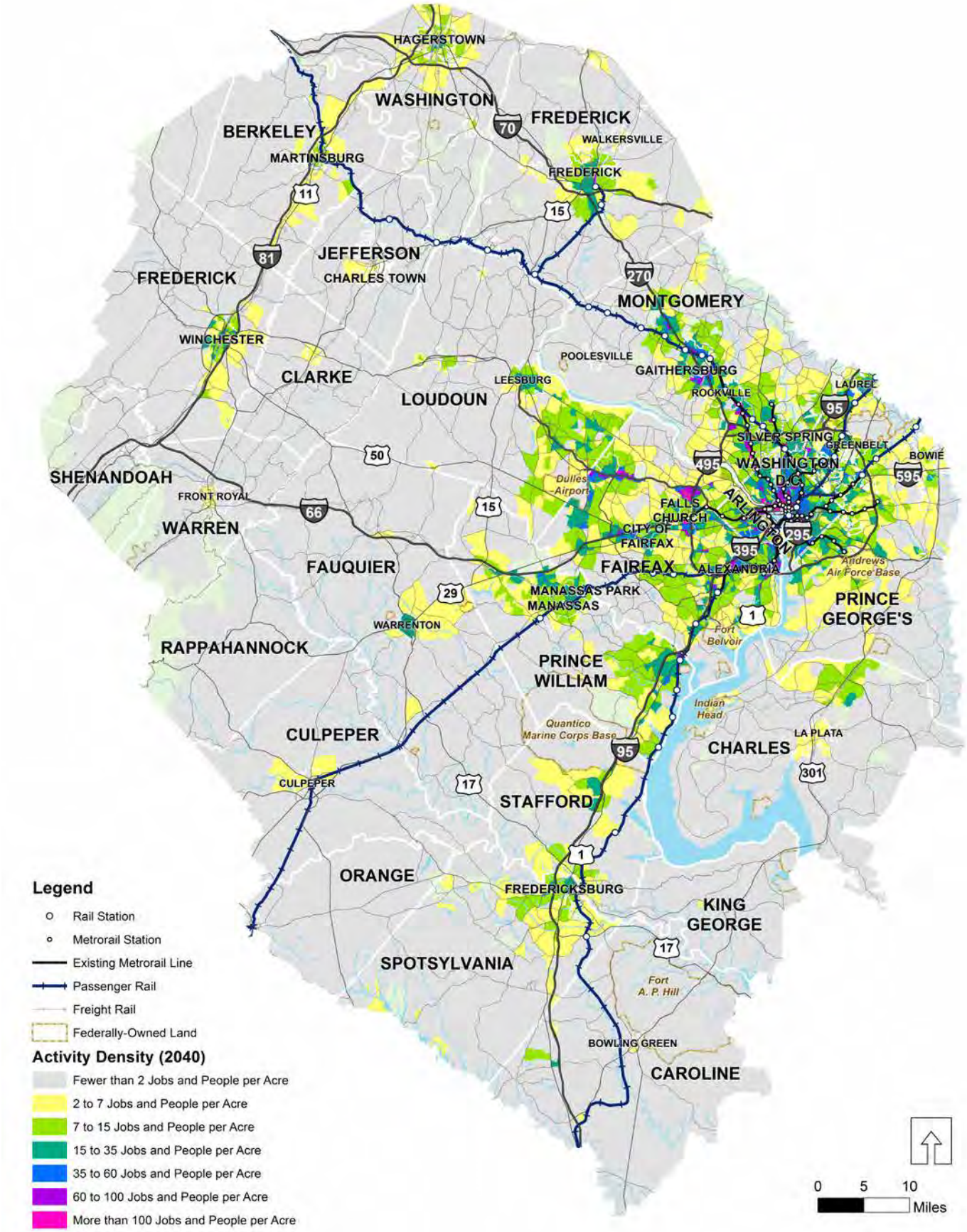


Figure 4.15: 2040 Activity Density

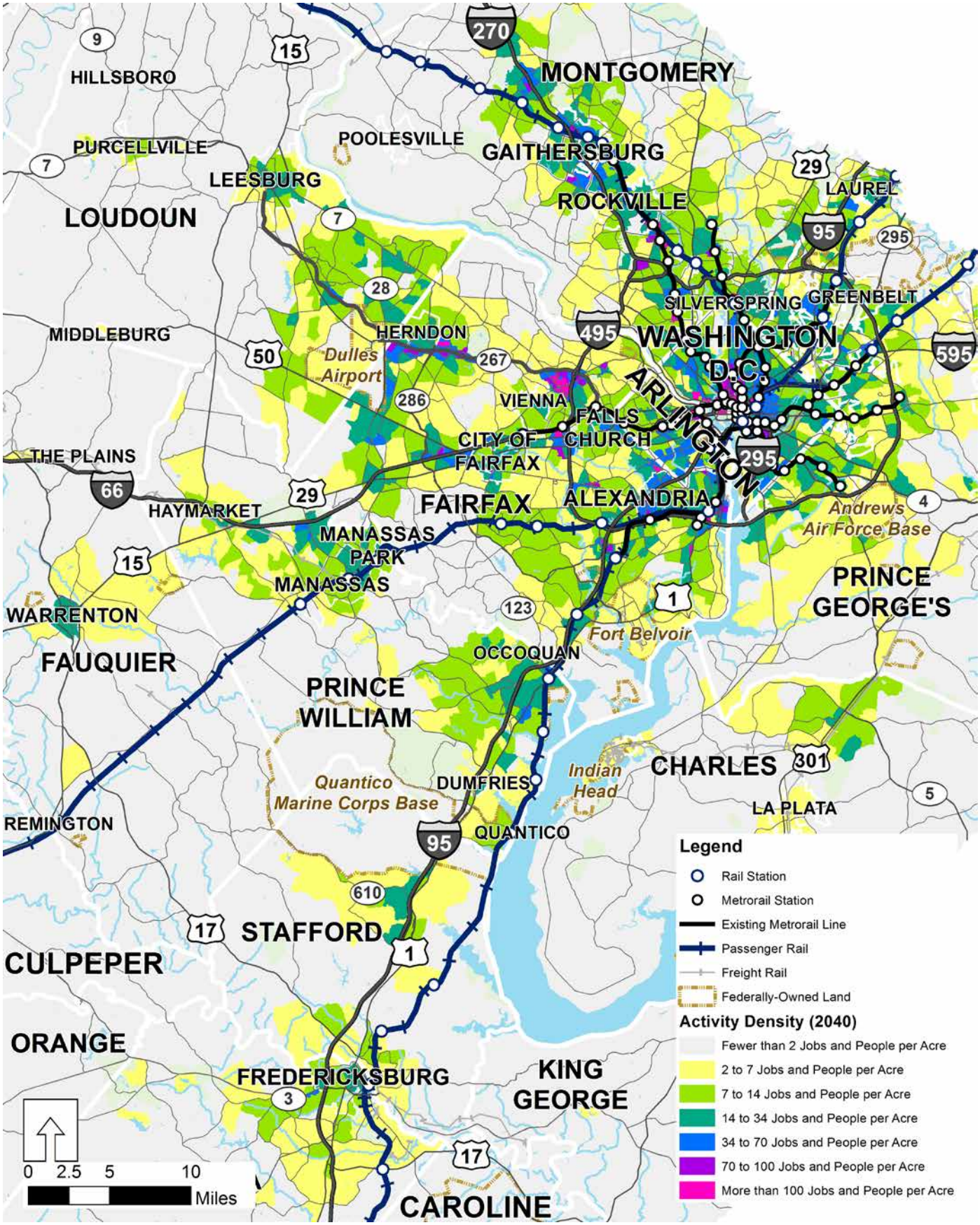


Figure 4.16: 2040 Activity Density – Inner Area

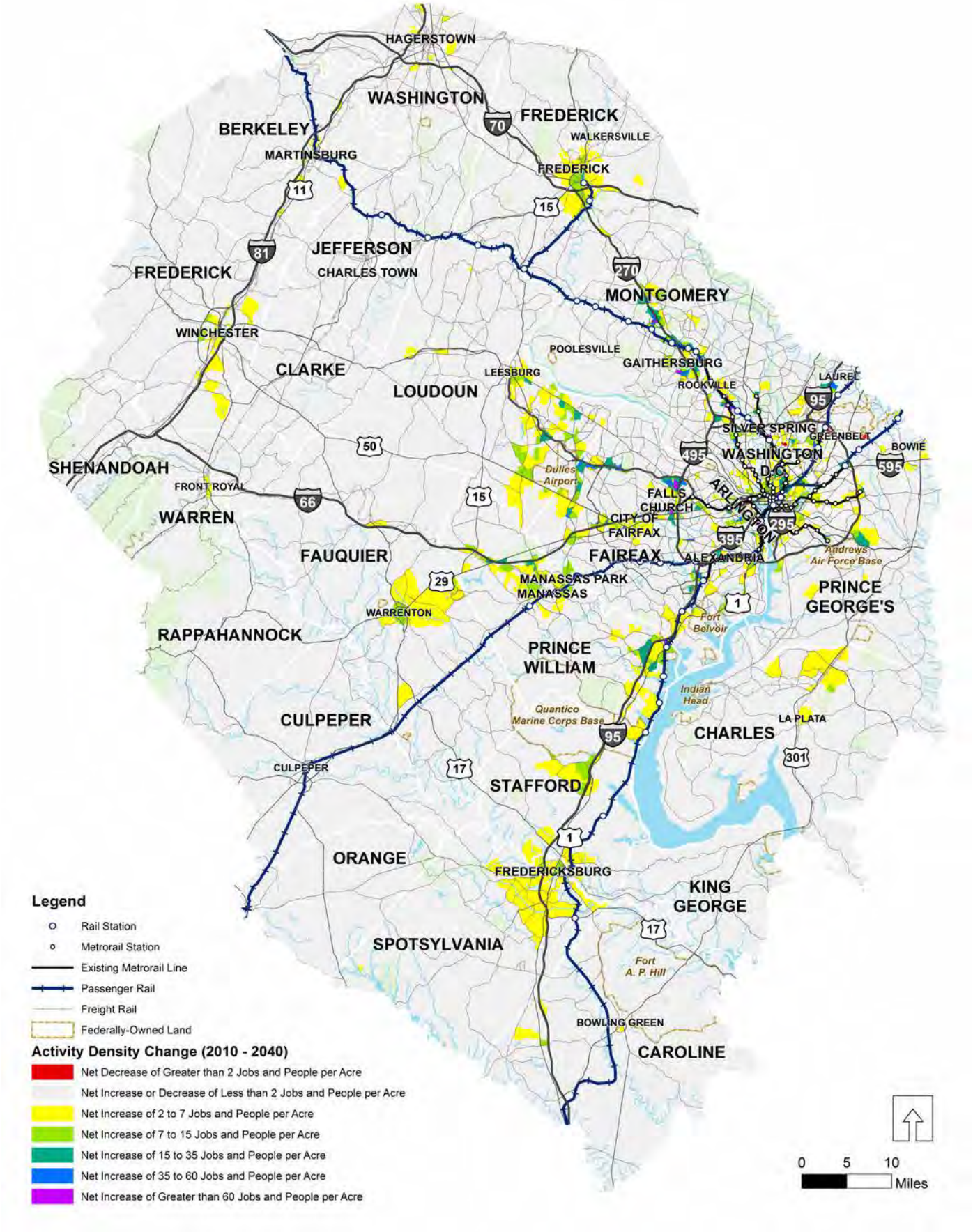


Figure 4.17: Change in Activity Density (2010 to 2040)

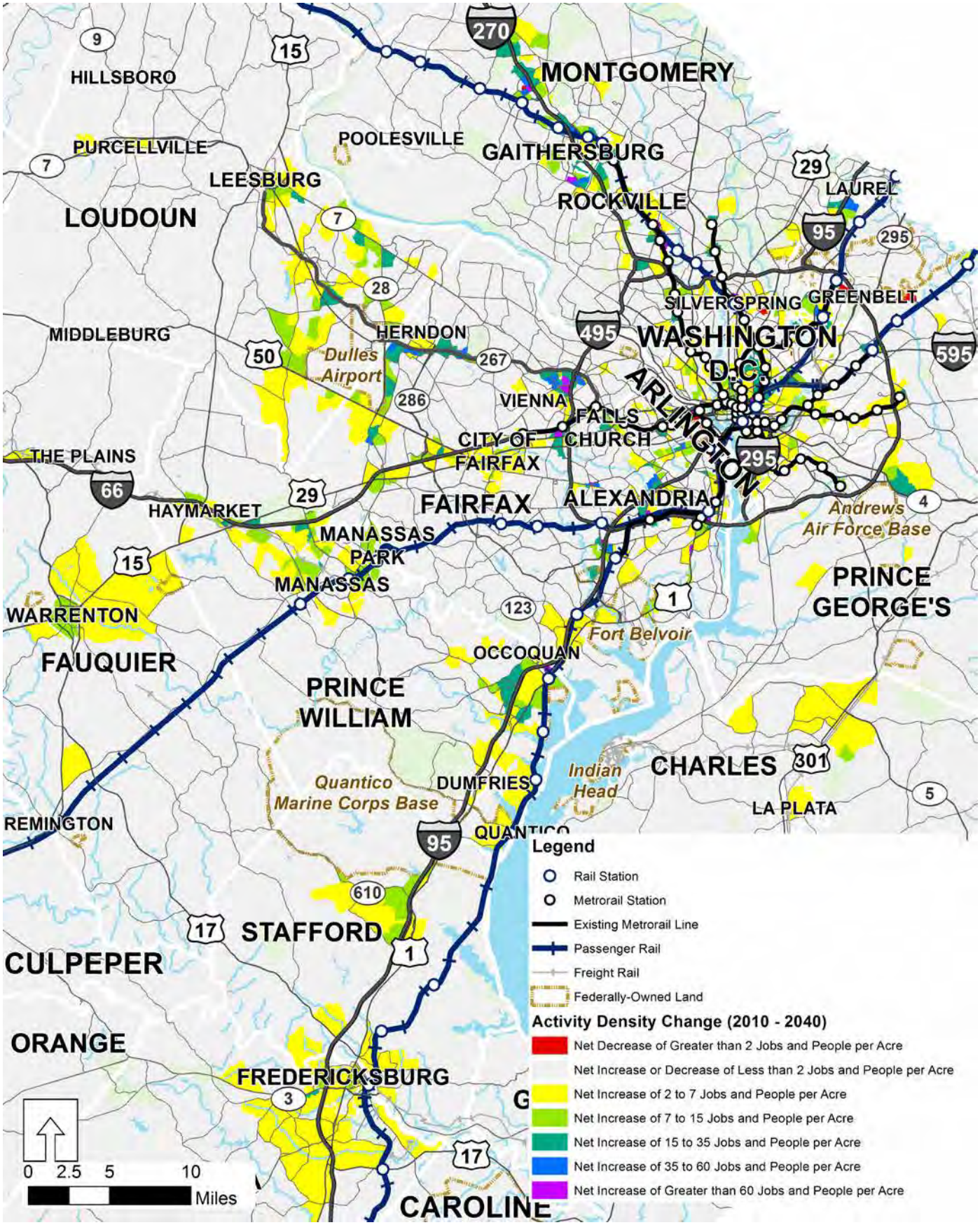


Figure 4.18: Change in Activity Density – Inner Area (2010 to 2040)

FUTURE LAND USE

Commuters make their way to Crystal City Metrorail station.

The third evaluation criterion for analysis, in addition to travel demand and demographic conditions, was land use. To analyze the entire region, a consistent set of land use definitions and terms was needed. A set of common regional place types and land use definitions were developed. Each area was categorized as one of the common place types using comprehensive plan land use and zoning data from local jurisdictions. This section describes the development of these place types and what they reveal about the region in 2040.

PLACE TYPES

The place types that were developed extend from highly urban to rural and natural. Place types were developed using the activity thresholds provided in DRPT's Multimodal and Public Space Design Guidelines. Other place types were developed using guidelines that included residential lot size, floor area ratio, and employee density. **Figure 4.19** shows the place types, including corresponding density guidelines and examples.

Core or Center Place Types			
Place Type	Activity Density Guideline (jobs + people / acre)	Example Place	Photos
Urban core	> 70	Downtown D.C., Rossyln	
Urban center	70 to > 34	Reston Town Center	
Large town or suburban center	34 to > 14	Leesburg business district	
Medium town or suburban center	14 to > 7	Fredericksburg or Culpeper business district	
Small town or suburban center	7 to > 2	Purcellville business district	
Rural or village center	2 to > 1	Lucketts, Loudoun County	

Figure 4.19: Place Type Descriptions

Other Place Types			
Place Type	Density Guideline	Characteristics	Photos
Mixed use neighborhood	> 14 jobs and people/acre	Mix of uses, lacking traditional center	
Regional retail center	.5 to 1.0 FAR* 4 employees/ 1,000 sf	Destination retail	
Suburban commercial	0.2 FAR* 3-4 employees/1,000 sf	Strip centers, shopping center	
Suburban office	0.2 to 1.0 FAR* 4 employees/ 1,000 sf	Office parks, buildings, campuses	
High density residential	< 0.25 acres/household	Multifamily, some townhomes on small lots	
Medium density residential	0.25 to 1 acres/household	Single family homes and townhomes on small lots	
Low density residential	1 to 5 acres/household	Single family homes on large lots	
Rural/natural/ very low density residential	> 5 acres/household	Parks, farmland, wetlands, single family homes on very large lots	
Industrial	0.2 FAR* 2 employees/ 1,000 sf	All industrial uses	
Institutional/ Military/Other	—	Schools, military installation, government uses, airports	

* FAR refers to floor area ratio, or the total area of a building divided by the total area of the lot on which it's located.

REGIONAL PLACE TYPE SUMMARY

After the place types were developed, each zoning or land use classification from local jurisdictions was assigned a place type and the data was mapped. The future place types do not reflect exiting conditions or necessarily future conditions in all cases, but represent what a place may become using existing comprehensive plan definitions and zoning. Near Washington, D.C., center place types tend to be closer in proximity to one another and larger in area than in the outer jurisdictions. Land area that is not part of a center in the inner suburbs tends to be residential, whereas the outer counties are generally comprised of rural or natural land with isolated rural centers.

Figure 4.20 and **Figure 4.21** show the future place types for the Super NoVa region and inner area, respectively.

PLANNED TRANSIT PROJECTS

Another factor that was taken into account when developing the recommendations for this study was regional transit projects, either under construction, programmed (funding allocated), or planned. This section briefly describes these major improvements to the region's transit service.

- **Dulles Rail Project** — Silver Metrorail Line will extend Metrorail service to Loudoun County, primarily along VA 267 west of the East Falls Church station. Heavy rail service will serve major activity centers such as Tysons Corner, Reston Town Center, and Dulles Airport.
- **I-95 Express Lanes** — HOT lanes from Stafford County to I-495. Bus transit will be able to use these lanes to avoid congestion.
- **I-495 Express Lanes** — HOT lanes on I-495 from I-95 to north of VA 267. Bus transit will be able to use these lanes to avoid congestion. Park-and-ride lot and bus service expansion is being advanced by DRPT in conjunction with this HOT/HOV lane project.
- **Potomac Yard Metrorail Station** — Infill station between National Airport and Braddock Road stations in the Potomac Yard area of the City of Alexandria.
- **Columbia Pike Streetcar** — Streetcar service between Pentagon City and Skyline along Columbia Pike (VA 244).
- **Crystal City/Potomac Yard Transitway** — High-capacity bus service between the Braddock Road Metrorail station in Alexandria and the Pentagon/ Pentagon City Metrorail station in Arlington County. Mode may transition to a streetcar north of the planned Potomac Yard Metrorail station in the future.
- **VRE Extensions** — VRE may extend the Manassas line west in Prince William County and will extend the Fredericksburg Line south to Crossroads in Spotsylvania County.
- **I-66 Environmental Study** — Tier 1 from I-495 west to Route 15 — Ongoing.
- **Route 7 Alternatives Analysis Study for Alexandria to Tysons** — Will begin Fall 2012.

Dulles Corridor Metrorail project at I-495.

Many of the improvements in the aforementioned list are either under construction or in final planning and design. In addition to these major corridor projects, planning documents such as transit development plans and corridor feasibility studies were reviewed to identify other planned projects that are not as large in scale or far along in the project development stage as the projects listed on the previous page. These plans identify potential transit service improvements for arterial corridors such a US Route 1 in Fairfax and Prince William Counties, Route 3 in Spotsylvania County, arterial transitway corridors in Alexandria, a priority transit network (PTN) in Arlington County, and enhanced public transportation corridors (EPTC) in Fairfax County. These and other planned projects were used as a framework for creating a final set of recommendations to ensure consistency and interconnectivity.

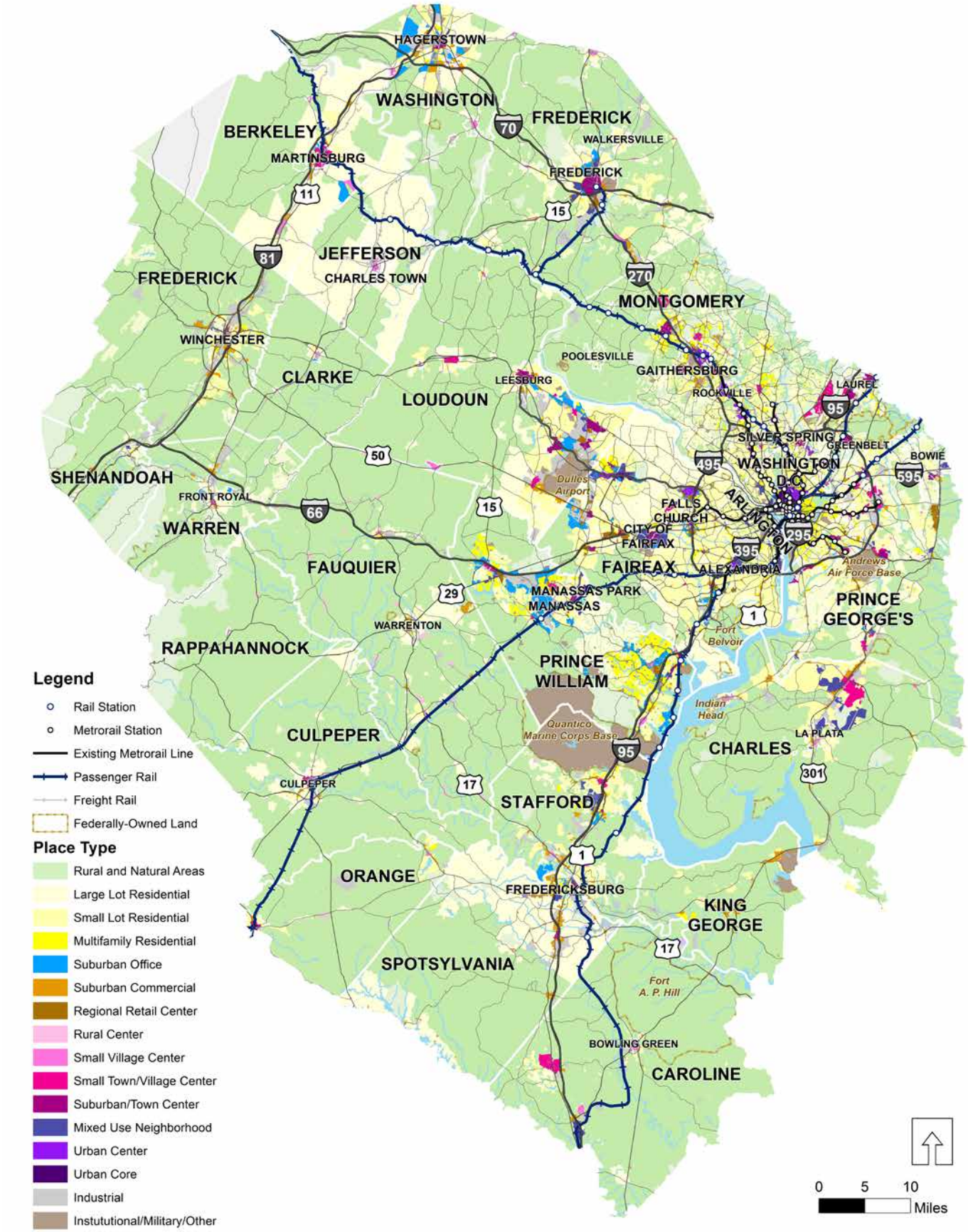


Figure 4.20: Future Place Types

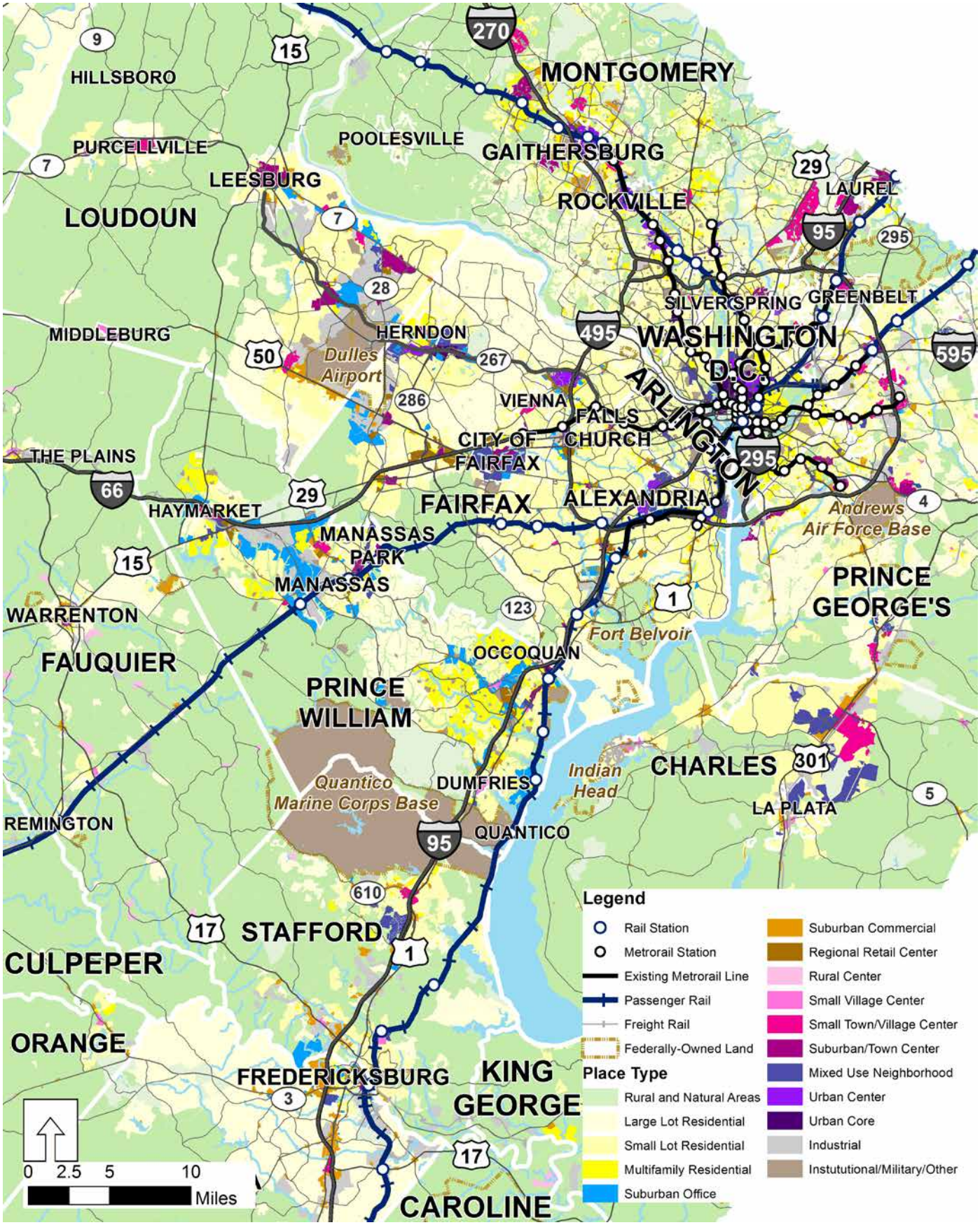


Figure 4.21: Future Place Types – Inner Area

FUTURE TRAVEL DEMAND

Reston Town Center Transit Station in Reston, VA.

FORECAST METHODOLOGY

A strong understanding of travel patterns provides an informational basis for identifying transit and TDM service needs, and recommendations that address those needs. The methodology used to analyze travel patterns in the Super NoVa region was briefly described in Chapter 3, and is summarized in the following:

- **District Development** — The Super NoVa region was broken into "districts". Outside of the traditionally-defined Washington Metropolitan area, districts were generally defined as counties. Within the metropolitan area, US Census Public Use Microdata (PUMA) boundaries were used. Overall, 50 districts were defined.
- **Trip Tables** — Fifty by 50 cell matrices of work and non-work trip tables were developed. Most of this data was developed with MPO travel demand models. The MWCOG travel demand model covers a large portion of the Super NoVa study area, and includes almost 90 percent of the Super NoVa region's 2010 population. For the remaining 10 percent of the Super NoVa region's population base, travel patterns were assessed by incorporating trip tables from the FAMPO model (model covers Fredericksburg, Spotsylvania, Stafford, Caroline, and King George Counties), the Win-Fred model (model covers City of Winchester and Frederick County) and the HEPMPO model (model covers Berkeley and Jefferson Counties, WV and Washington County, MD). The MWCOG model uses 2040 as a horizon year. The HEPMPO, FAMPO, and Win-Fred models use 2035 as a horizon year. Trips for those areas were extrapolated to 2040 based on population growth rates.

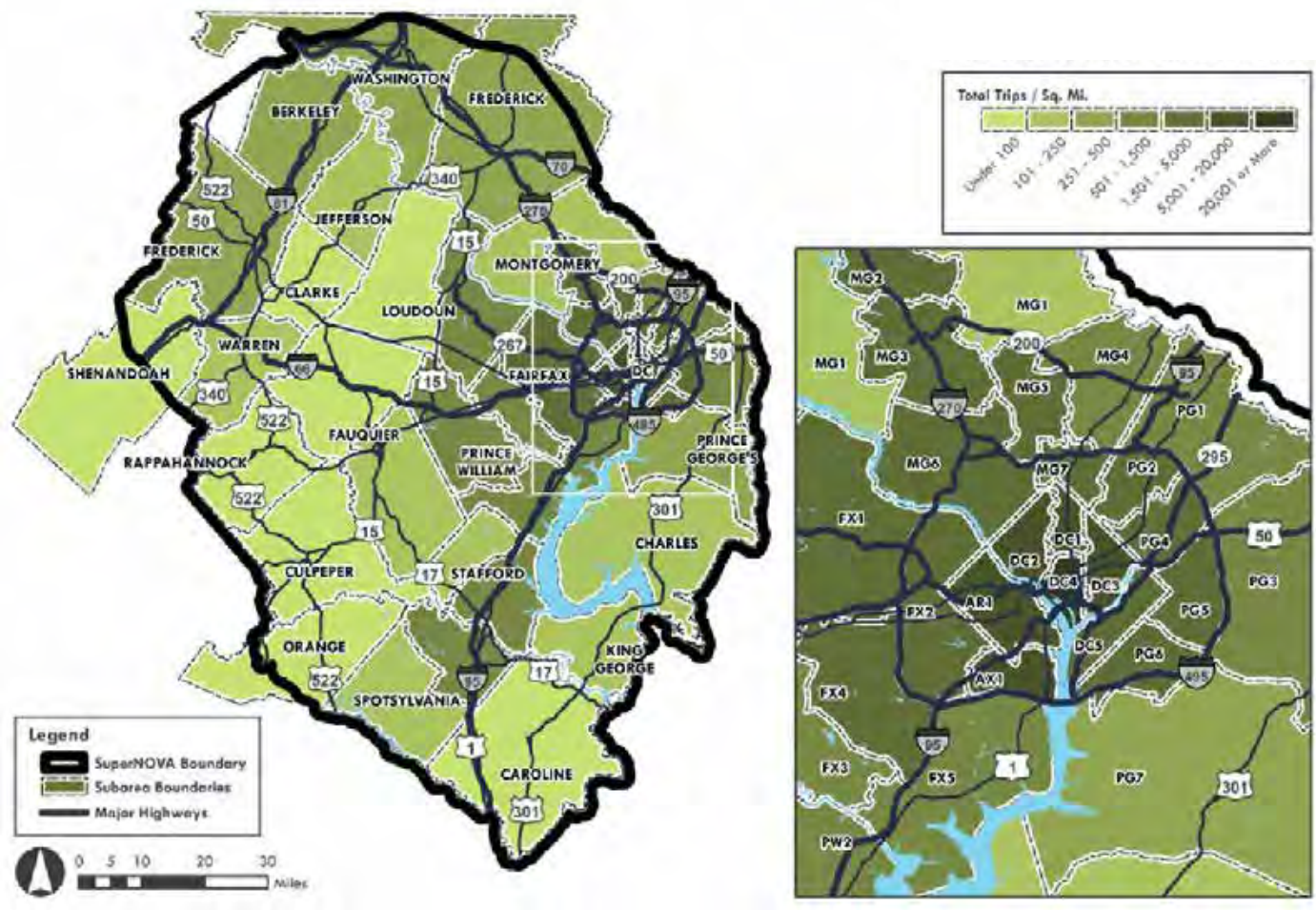


Figure 4.22: 2040 Daily Trips per Square Mile in Super NoVa Region

There are five counties within the Super NoVa region that are not within a defined MPO and, thus, are not included in any of the above-noted travel demand models (Shenandoah, Warren, Rappahannock, Culpeper, and Orange Counties). For those five counties, trips have been estimated based on general trip generation estimates that are tied to each county's population projections.

- **Trip Distribution** — Trips were distributed between the 50 districts. For trip distributions between different travel demand model areas, external trip volumes were first identified from each model area. Those trips were then distributed to other defined Super NoVa districts based on ACS journey to work data.
- **Needs** — Transit and TDM service needs were then determined by comparing travel patterns to existing and planned transit/TDM services and identifying gaps and deficiencies. The **Appendix** presents a more thorough description of the methodology and results for work and non-work trips. For the purpose of this report, only existing work trips have been summarized.

FUTURE TRAVEL TRENDS

Figure 4.22 illustrates horizon year (2040) daily home-to-work person trips per square mile for the Super NoVa region. As one would expect, the largest concentration of trips is in the metropolitan Washington, D.C. area. **Figure 4.23** illustrates 2040 home-to-work person trip travel flows. This figure illustrates the importance of key corridors (e.g., I-95, I-66, Route 7, and I-270) for long-distance, work-related travel. Following, is a closer look at work travel pattern characteristics by subarea.

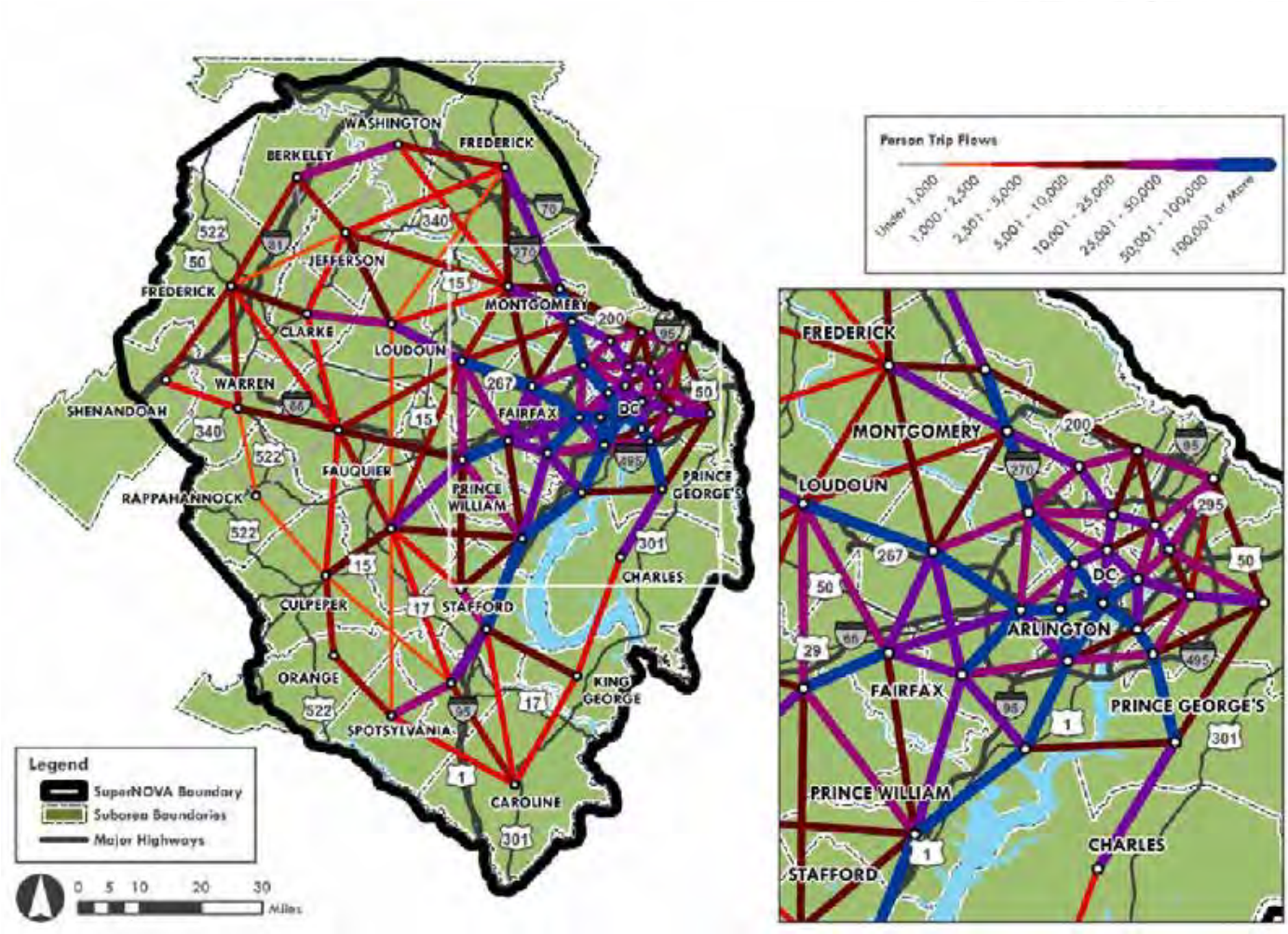


Figure 4.23: 2040 Daily Work Person Trip Travel Flows

Inner Area Subarea Travel Patterns

Jurisdictions included in the definition of the Super NoVa's inner subarea are:

- District of Columbia
- Arlington County
- Fairfax County
- City of Alexandria

Table 4.4 presents total home-to-work trips for analysis districts in the inner areas of the Super NoVa region. The values are person trips and represent work travel to and from the inner areas. Overall, there is a projected 34.2 percent growth rate in daily home-to-work person trips, with a total of 1.675 million daily home-to-work trips from 2007 to 2040 (e.g., more than 3.3 million daily work trips).

Table 4.4: Inner Area Daily Home-to-Work Trips (Peak Direction Trips)

District	2007	2040	Difference	Growth Rate
D.C. (All Areas)	461,151	576,678	115,527	25.1%
Arlington	155,692	227,660	71,968	46.2%
Fairfax (All Areas)	553,071	761,000	207,930	37.6%
Alexandria	76,469	108,248	31,779	41.6%
TOTAL	1,248,390	1,675,627	427,205	34.2%

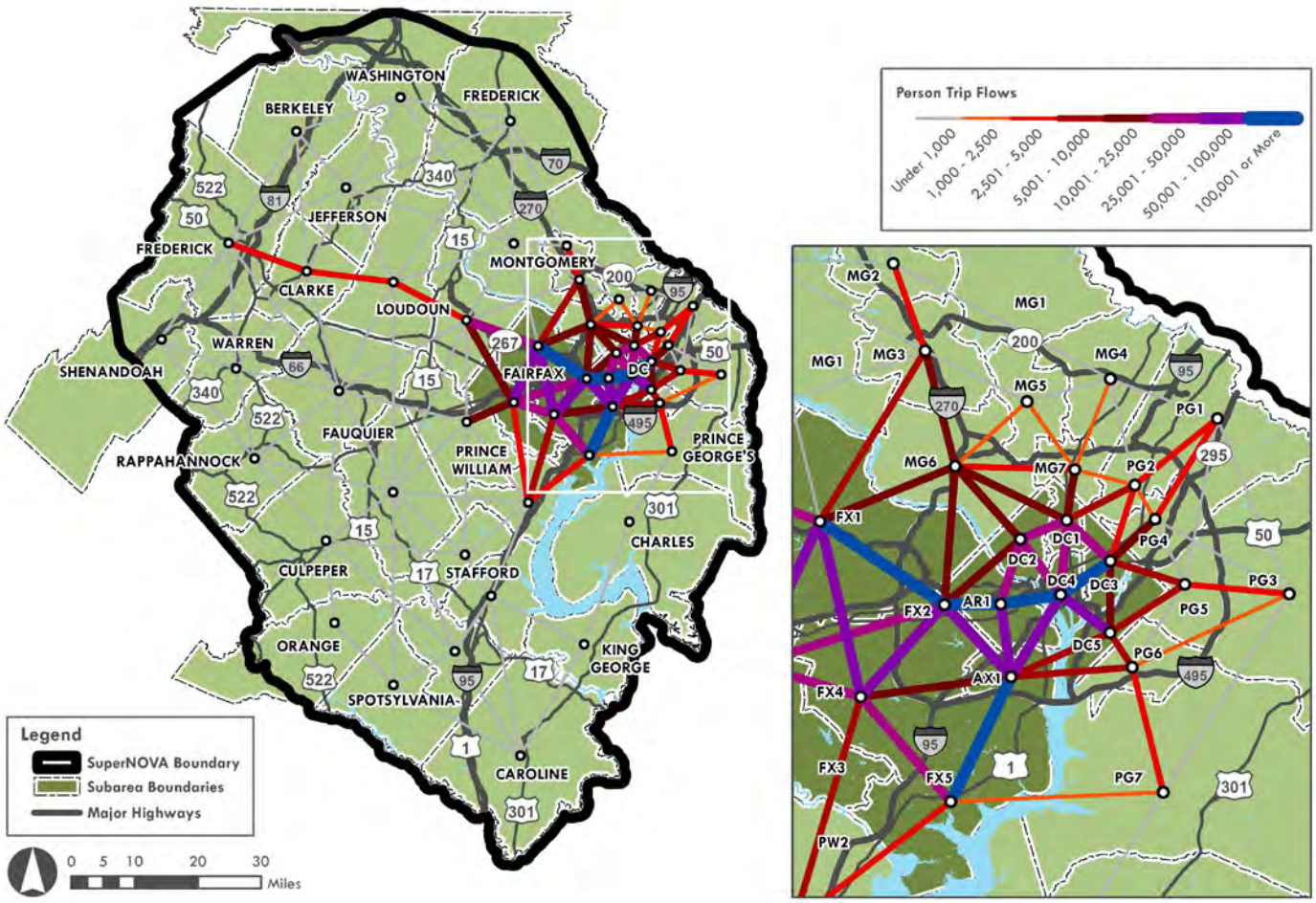


Figure 4.24: 2040 Daily Work Person Trips from Inner Subarea

Figure 4.24 and **Figure 4.25** present spider line diagrams of 2040 work trips coming from and going to inner area analysis districts. As these figures illustrate, the trips coming to employment within the inner area have much longer travel sheds than trips coming from households in the inner area.

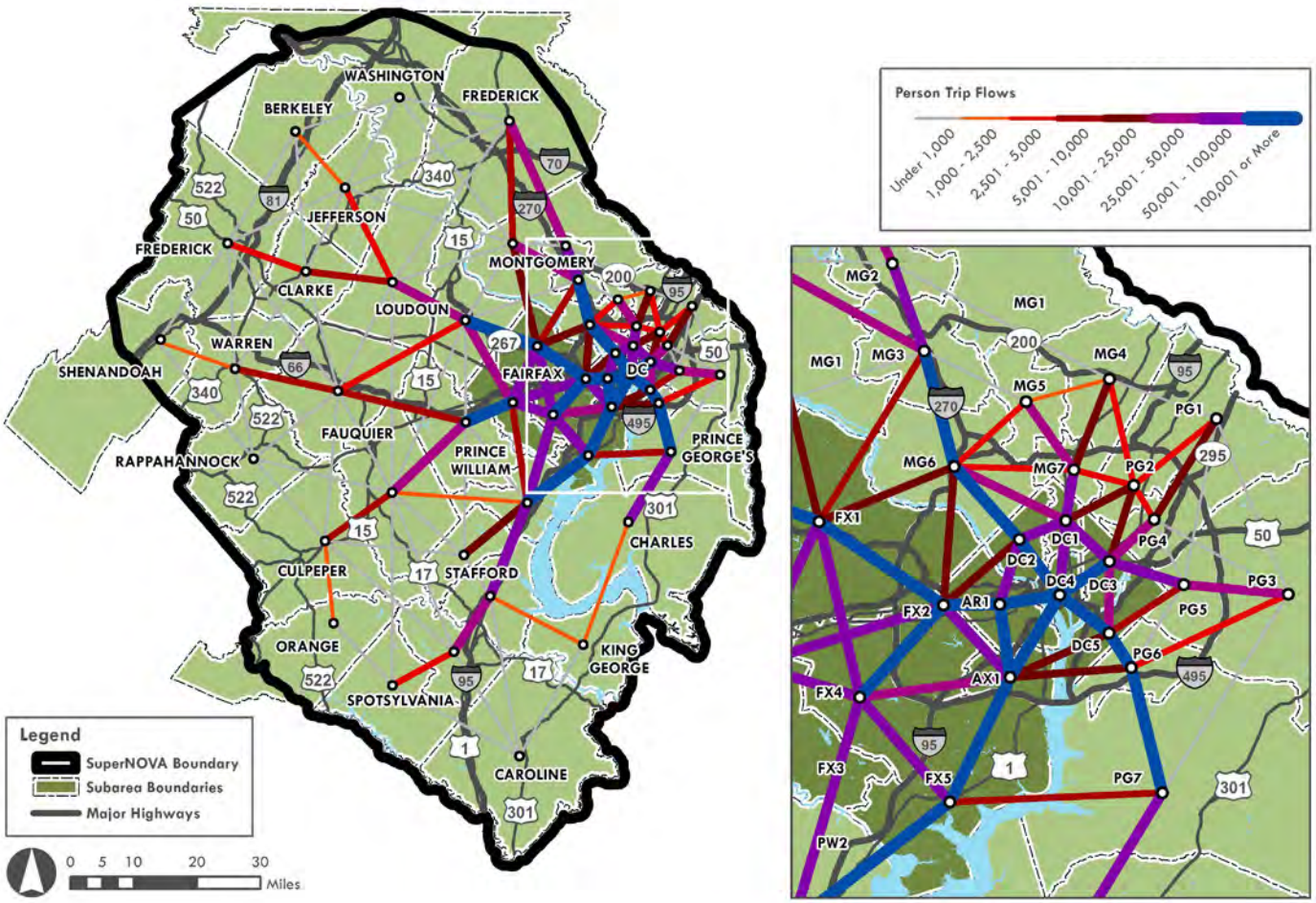


Figure 4.25: 2040 Daily Work Person Trips to Inner Subarea

Northwest Subarea Travel Patterns

The Northwest subarea of the Super NoVa region includes the following locations:

- Loudoun County, VA
- Jefferson County, WV
- Clarke County, VA
- Frederick County, VA
- Berkeley County, WV

For the purpose of the analysis, Loudoun County has been divided into two districts—Loudoun County 1 and Loudoun County 2. The Loudoun County 2 district comprises the urbanized area of Loudoun County to the east, and the Loudoun County 1 district is the less developed western portion of the county.

There is projected to be a 78 percent increase in daily home-to-work person trips between 2007 and 2040, as illustrated in **Table 4.5**.

Table 4.5: Northwest Subarea Daily Home-to-Work Trips (Peak Direction Trips)

District	2007	2040	Difference	Growth Rate
Loudoun 1	11,457	23,798	12,340	107.7%
Loudoun 2	95,560	173,797	78,237	81.9%
Jefferson, WV	15,871	28,850	12,979	81.8%
Clarke, VA	5,782	8,263	2,480	42.9%
Frederick, VA	43,509	77,778	34,269	78.8%
Berkeley, WV	34,260	55,381	21,121	61.7%
TOTAL	206,440	367,866	161,427	78.2%

All counties are anticipated to continue to be an exporter of home-to-work trips; however, there is anticipated to be a significant increase in work trips traveling to Loudoun District 2 (East Loudoun County), as illustrated in **Figure 4.26** and **Figure 4.27**.

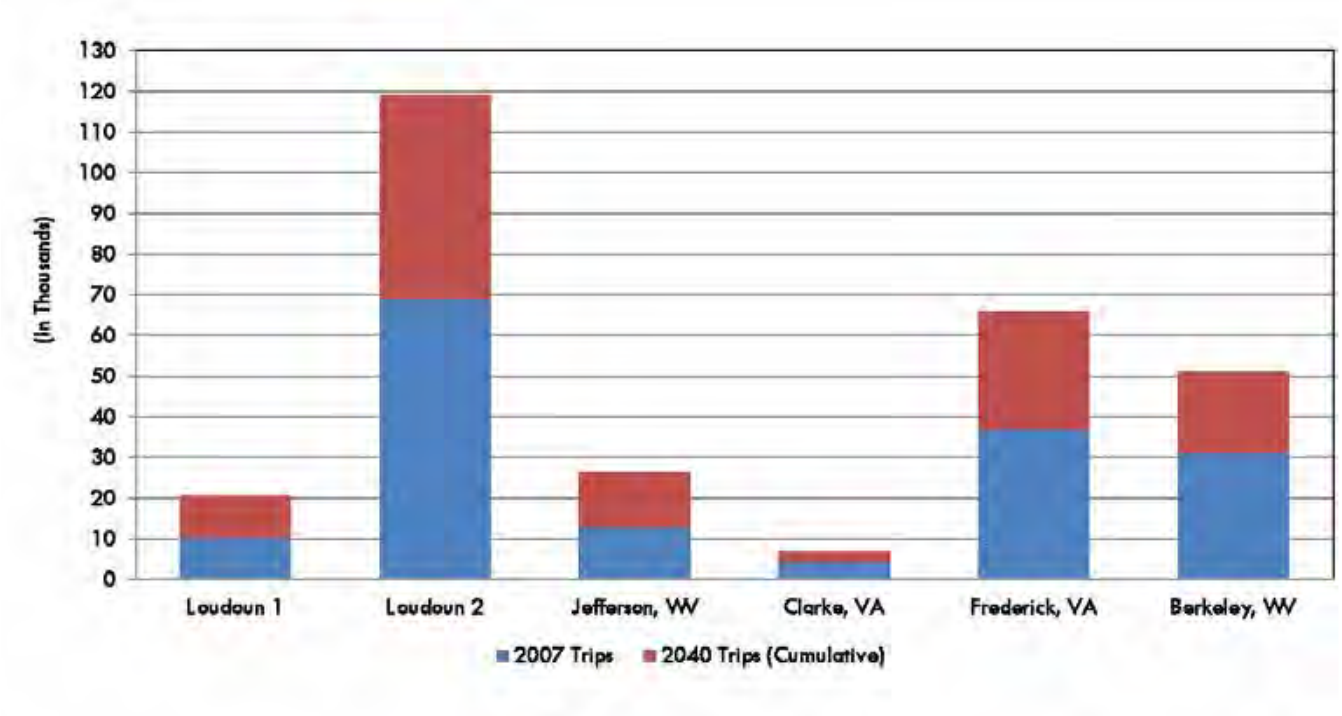


Figure 4.26: 2007 and 2040 Daily Work Trips From Northwest Subarea Counties

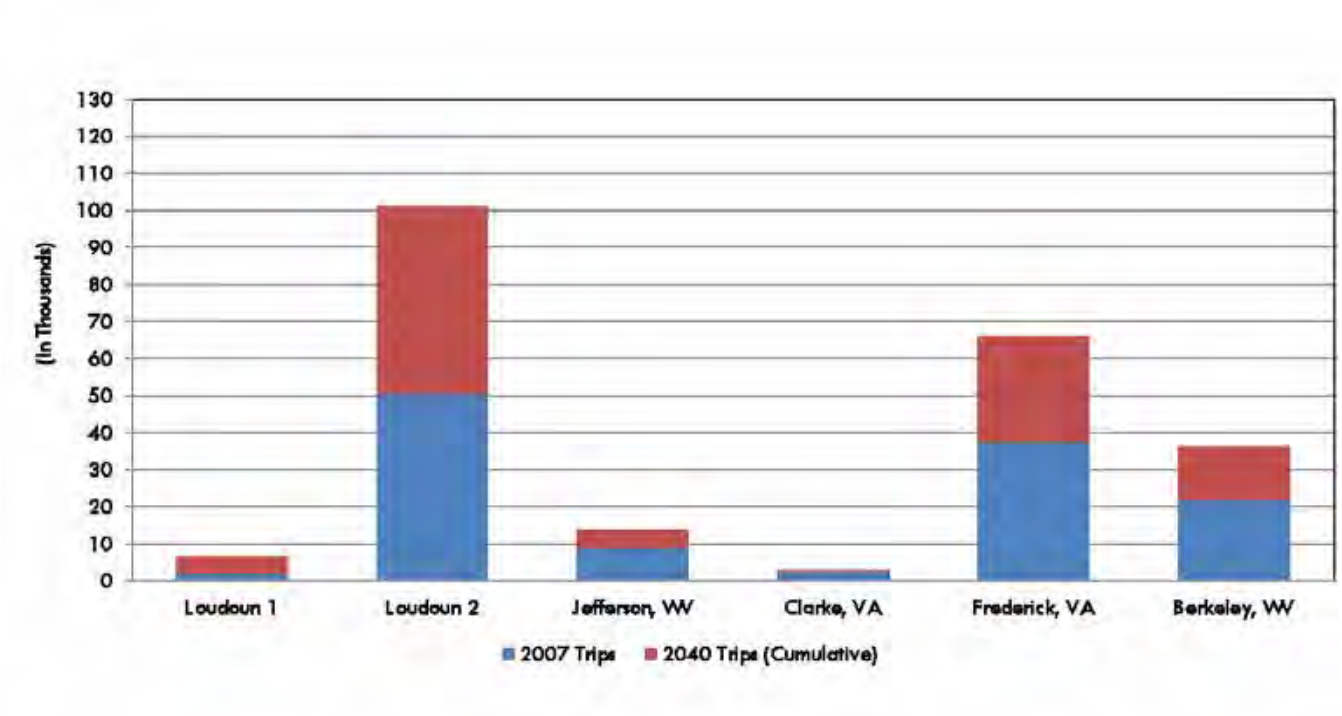


Figure 4.27: 2007 and 2040 Daily Work Trips To Northwest Subarea Counties

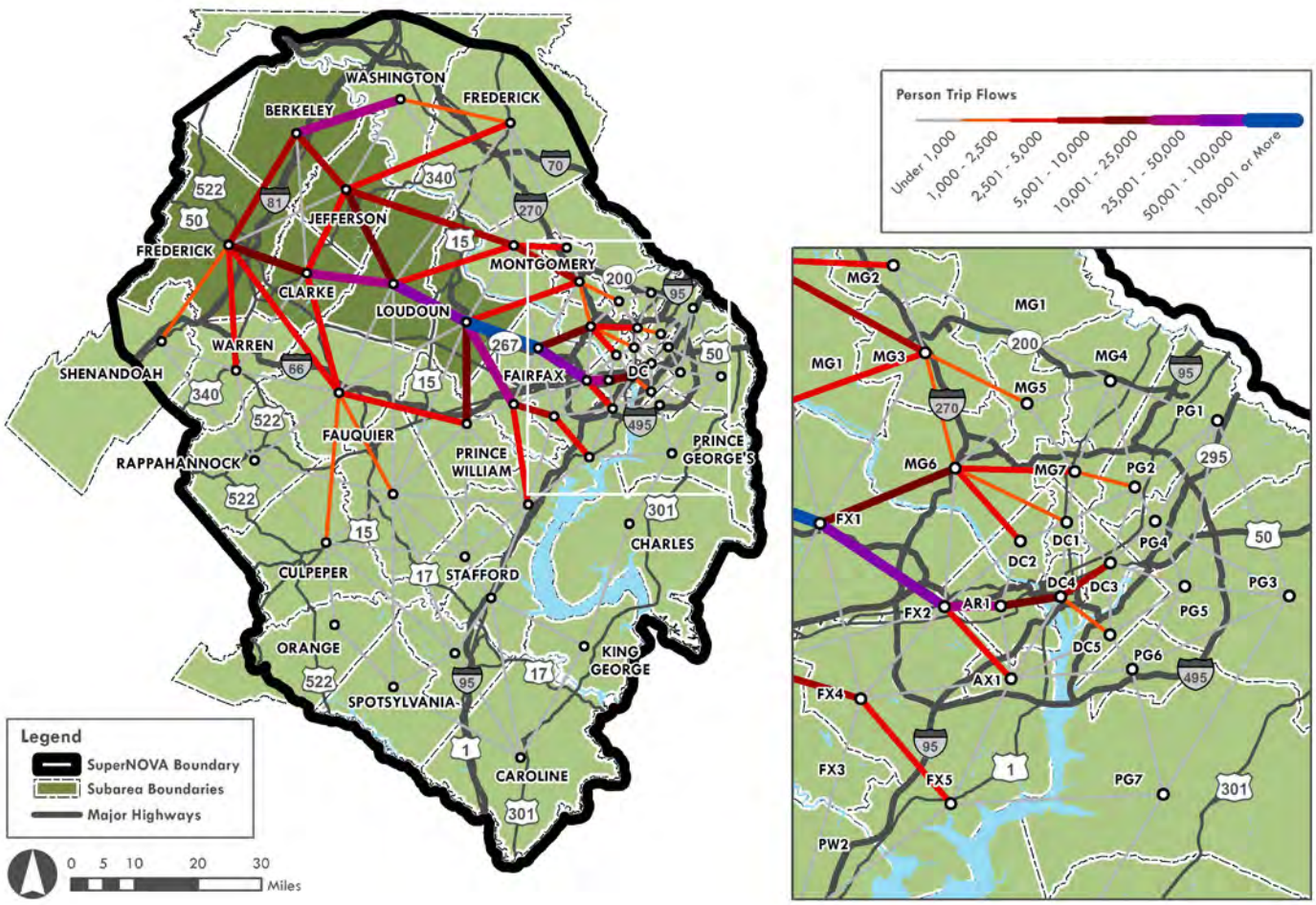


Figure 4.28: 2040 Daily Work Person Trips from Northwest Subarea

Figure 4.28 and **Figure 4.29** present spider line diagrams of daily work trips coming from and going to the Northwest subarea districts, respectively.

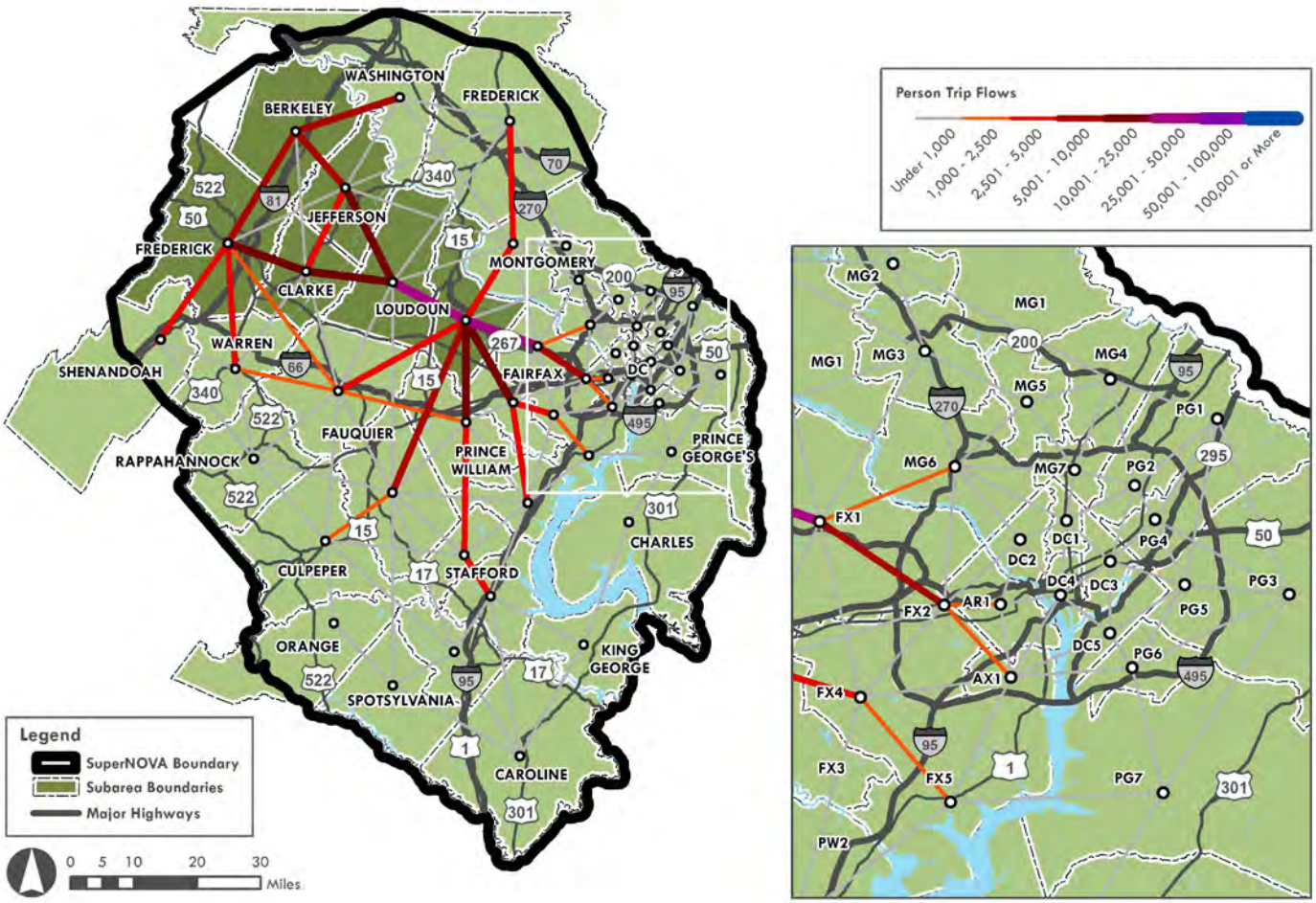


Figure 4.29: 2040 Daily Work Person Trips to Northwest Subarea

West Subarea Travel Patterns

The West subarea of the Super NoVa region encompasses the following locations:

- Fauquier County
- Shenandoah County
- Warren County
- Culpeper County
- Orange County
- Rappahannock County

For purposes of this travel pattern analysis, Fauquier County has been divided into two districts, with the Towns of Remington and Warrenton included in the southern Fauquier County district and points north of Warrenton in the northern district.

In 2007, there are an estimated 67,000 daily home-to-work-related person trips for the West subarea counties (e.g., 134,000 total daily work trips). This is anticipated to grow by 93 percent by 2040. **Table 4.6** presents total daily home-to-work trips for the six West subarea counties that are within this defined Super NoVa region.

Table 4.6: West Subarea Daily Home-to-Work Trips (Peak Direction Trips)

District	2007	2040	Difference	Growth Rate
Fauquier 1	5,241	8,928	3,688	70.4%
Fauquier 2	19,732	49,591	29,859	151.3%
Shenandoah	9,318	15,225	5,907	63.4%
Warren	10,819	18,515	7,696	71.1%
Culpeper	12,860	25,348	12,488	97.1%
Orange	6,707	8,327	1,620	24.2%
Rappahannock	1,888	2,712	824	43.6%
TOTAL	66,564	128,646	62,082	93.3%

All of the counties in the West subarea are “exporters” of work trips. In other words, there are more trips leaving each county than entering the county. This is illustrated in **Figure 4.30** and **Figure 4.31**.

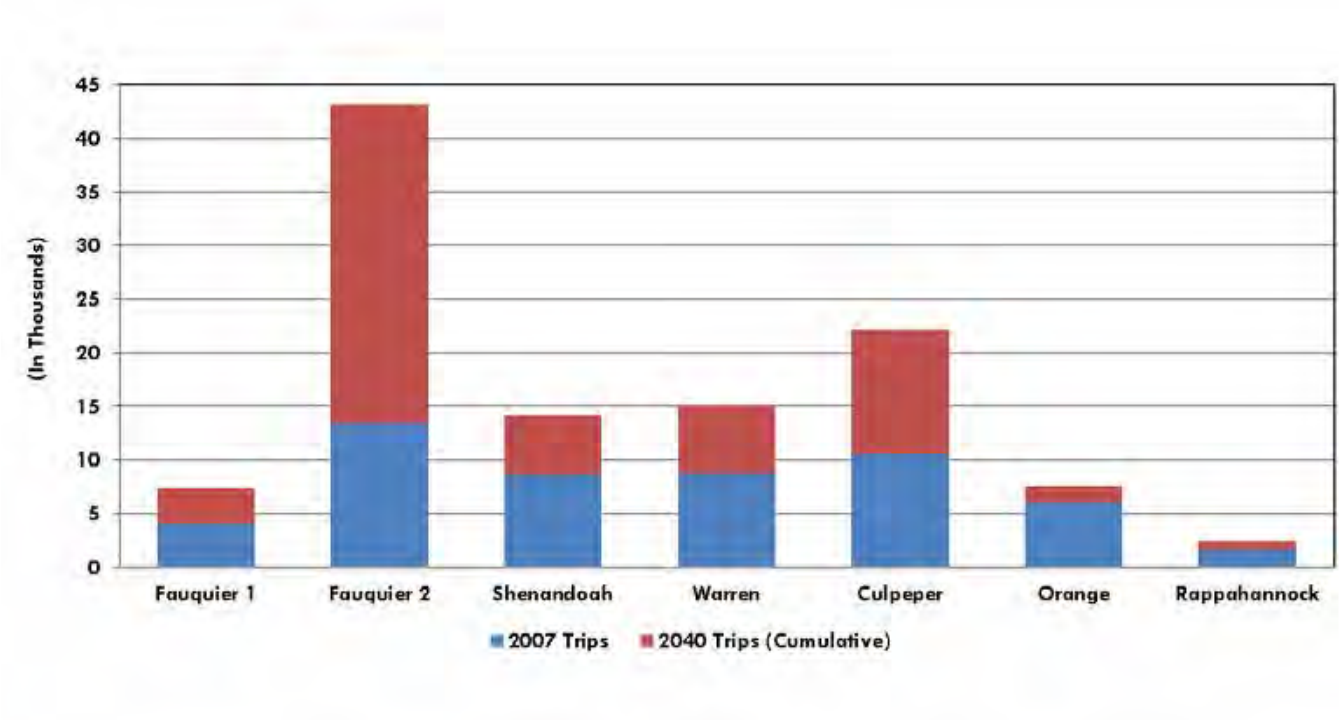


Figure 4.30: 2007 and 2040 Daily Work Trips From West Subarea Counties

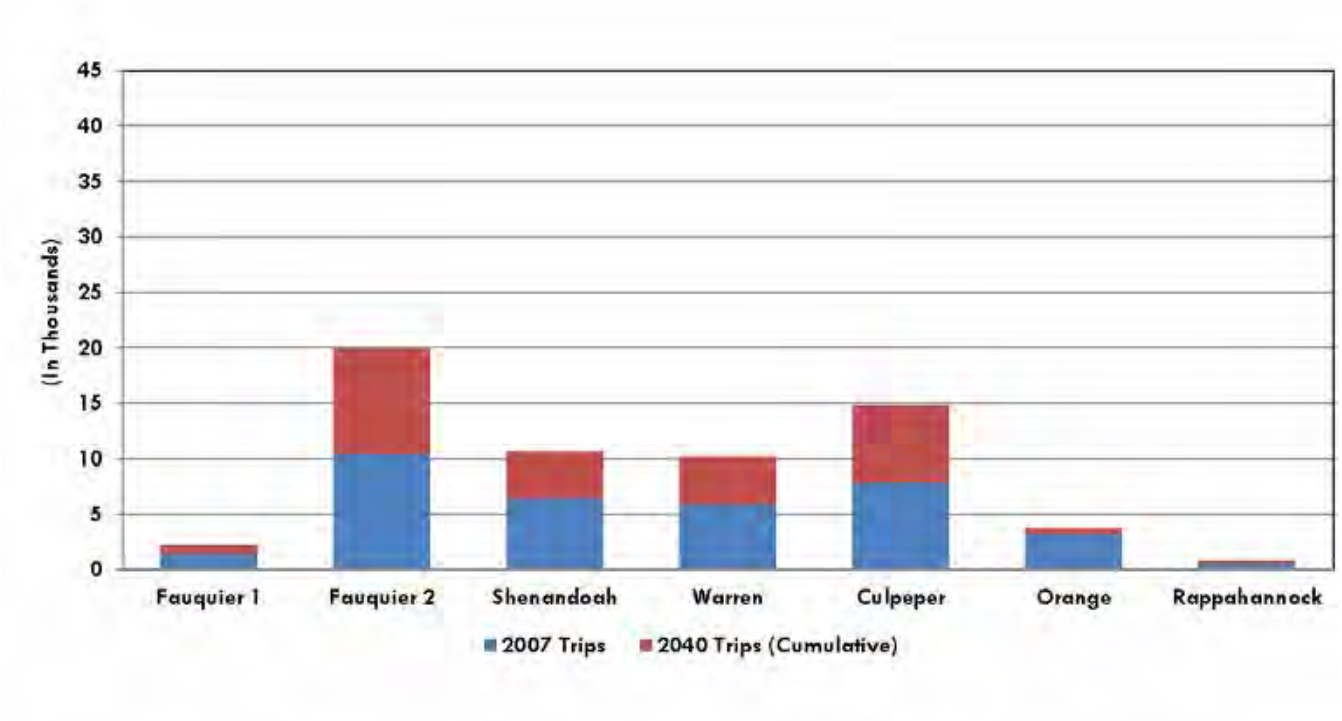


Figure 4.31: 2007 and 2040 Daily Work Trips To West Subarea Counties

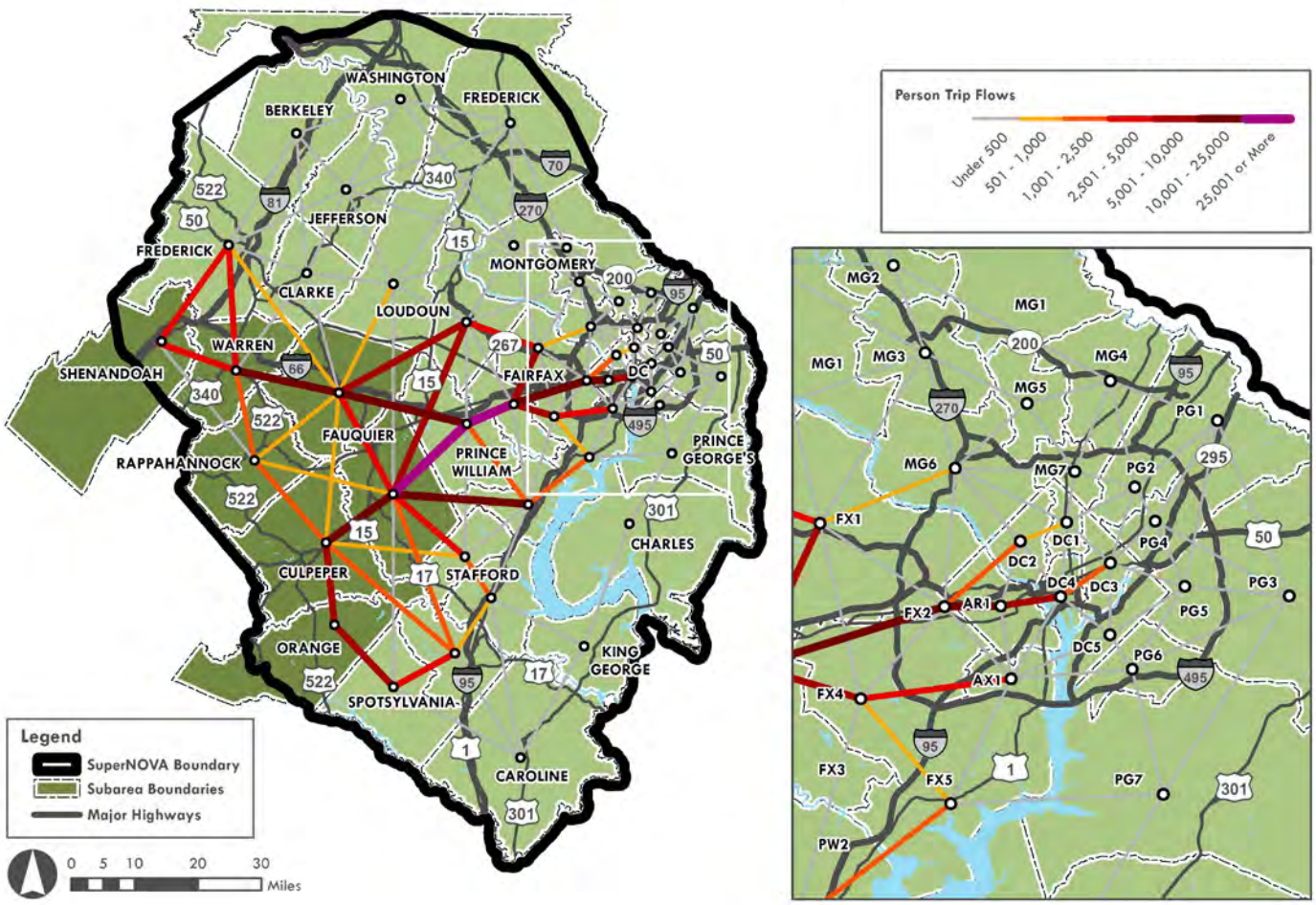


Figure 4.32: 2040 Daily Work Person Trips from West Subarea

Figure 4.32 and **Figure 4.33** present spider line diagrams of 2007 daily work trips coming from and going to West subarea districts, respectively.

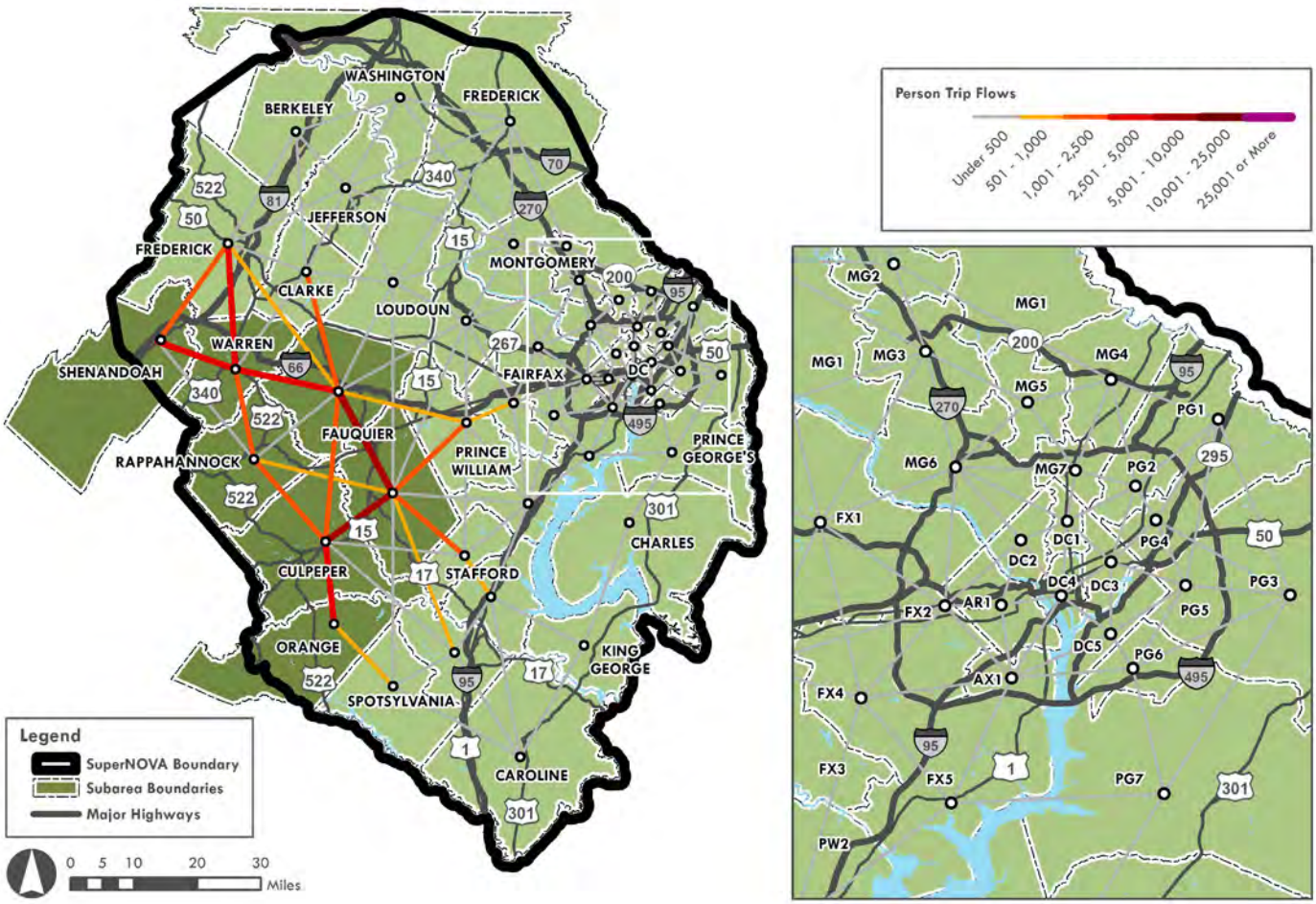


Figure 4.33: 2040 Daily Work Person Trips to West Subarea

South Subarea Travel Pattern

The South subarea of the Super NoVa region encompasses the following locations:

- Prince William County
- Stafford County
- Spotsylvania County
- Caroline County
- King George County
- City of Fredericksburg
- Cities of Manassas and Manassas Park

For purposes of this travel pattern analysis, Prince William and Stafford and Spotsylvania Counties have been divided into two districts each, with the City of Fredericksburg included in one of the Spotsylvania County districts, and Manassas and Manassas Park included in one of the Prince William County districts.

Daily home-to-work-related person trips for the South subarea districts are estimated to be 271,000 trips in 2007 (e.g., 542,000 total daily work trips). By 2040, daily home-to-work trips are anticipated to grow by nearly 90 percent.

Table 4.7: South Subarea Daily Home-to-Work Trips (Peak Direction Trips)

District	2007	2040	Difference	Growth Rate
Prince William 1	78,249	134,823	56,574	72.3%
Prince William 2	76,563	135,815	59,251	77.4%
Stafford 1	33,839	71,662	37,823	111.8%
Stafford 2	10,782	21,187	10,405	96.5%
Spotsylvania 1	11,894	29,254	17,360	146.0%
Spotsylvania 2	46,749	90,435	43,686	93.4%
Caroline	6,506	14,033	7,528	115.7%
King George	6,873	14,849	7,976	116.1%
TOTAL	271,454	512,058	240,604	88.6%

The districts in the South subarea are net “exporters” of work trips. In other words, there are more trips originating from rather than drawn to each district, as noted in **Figure 4.34** and **Figure 4.35**.

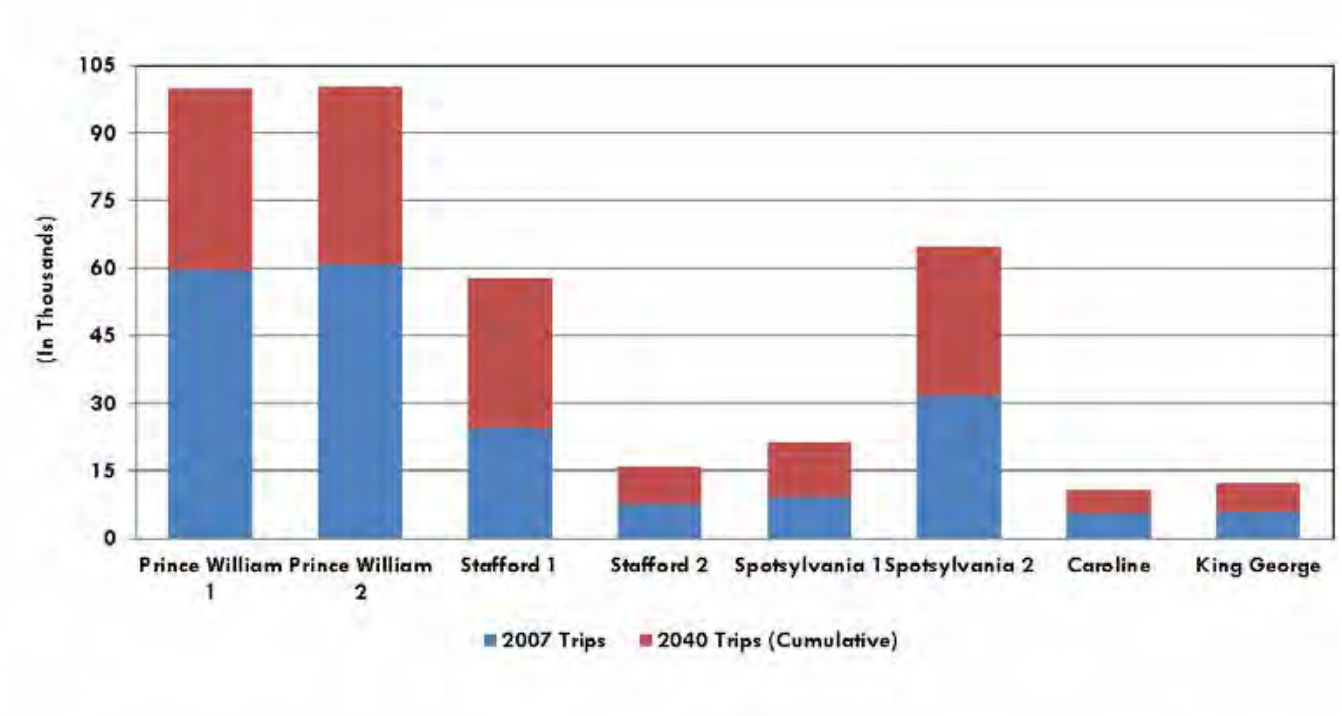


Figure 4.34: 2007 and 2040 Daily Work Trips From South Subarea Districts

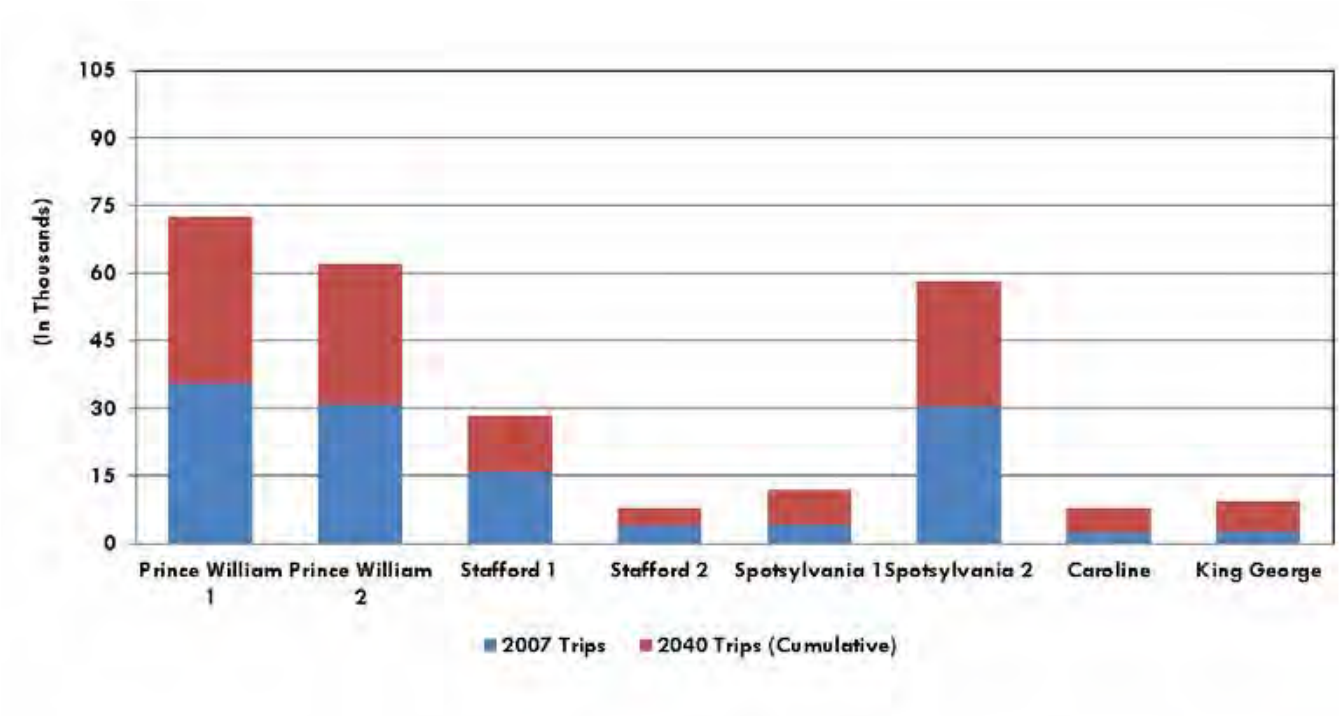


Figure 4.35: 2007 and 2040 Daily Work Trips To South Subarea Districts

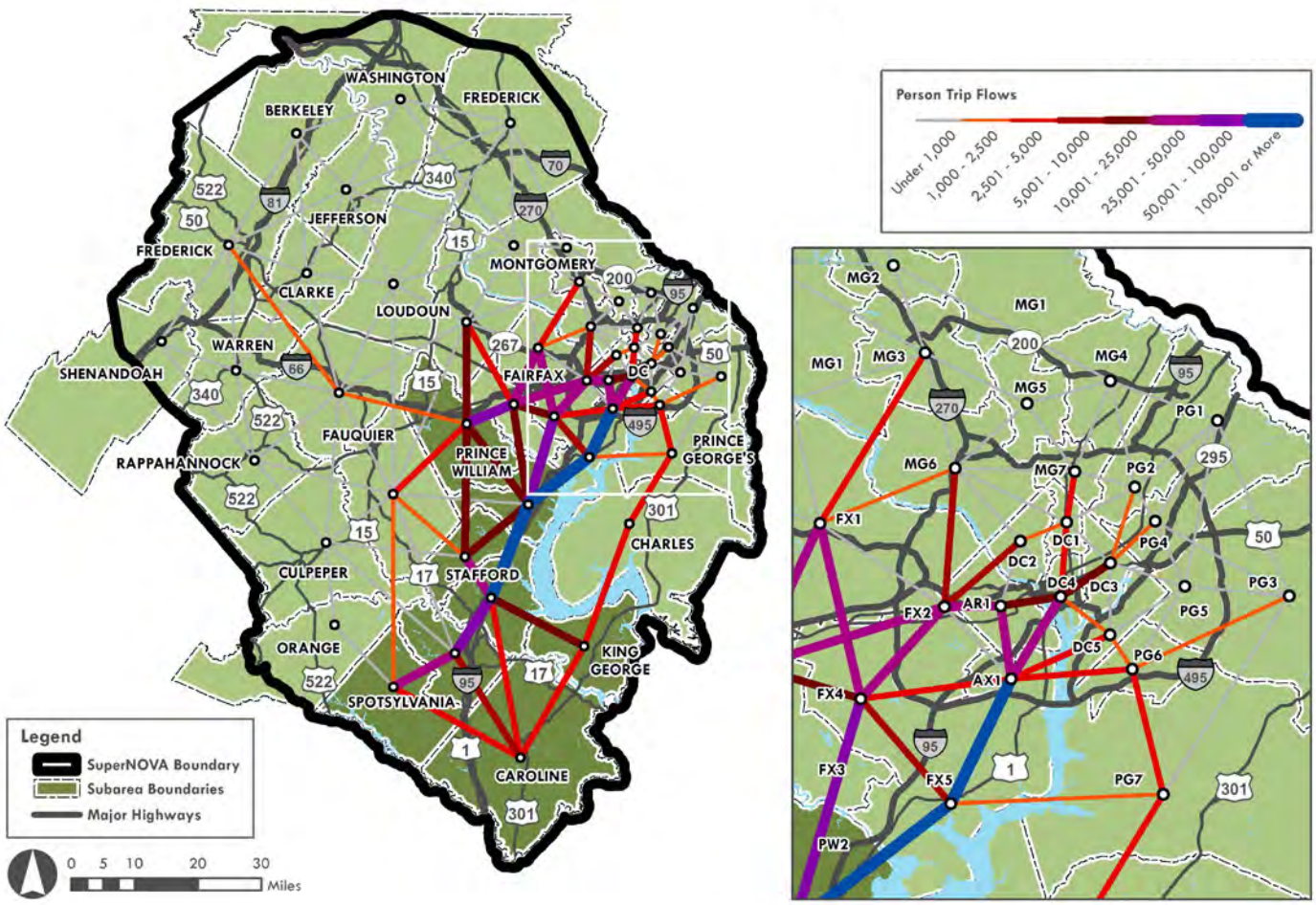


Figure 4.36: 2040 Daily Work Person Trips from South Subarea

Figure 4.36 and **Figure 4.37** present spider line diagrams of 2007 daily work trips coming from and going to South subarea districts, respectively.

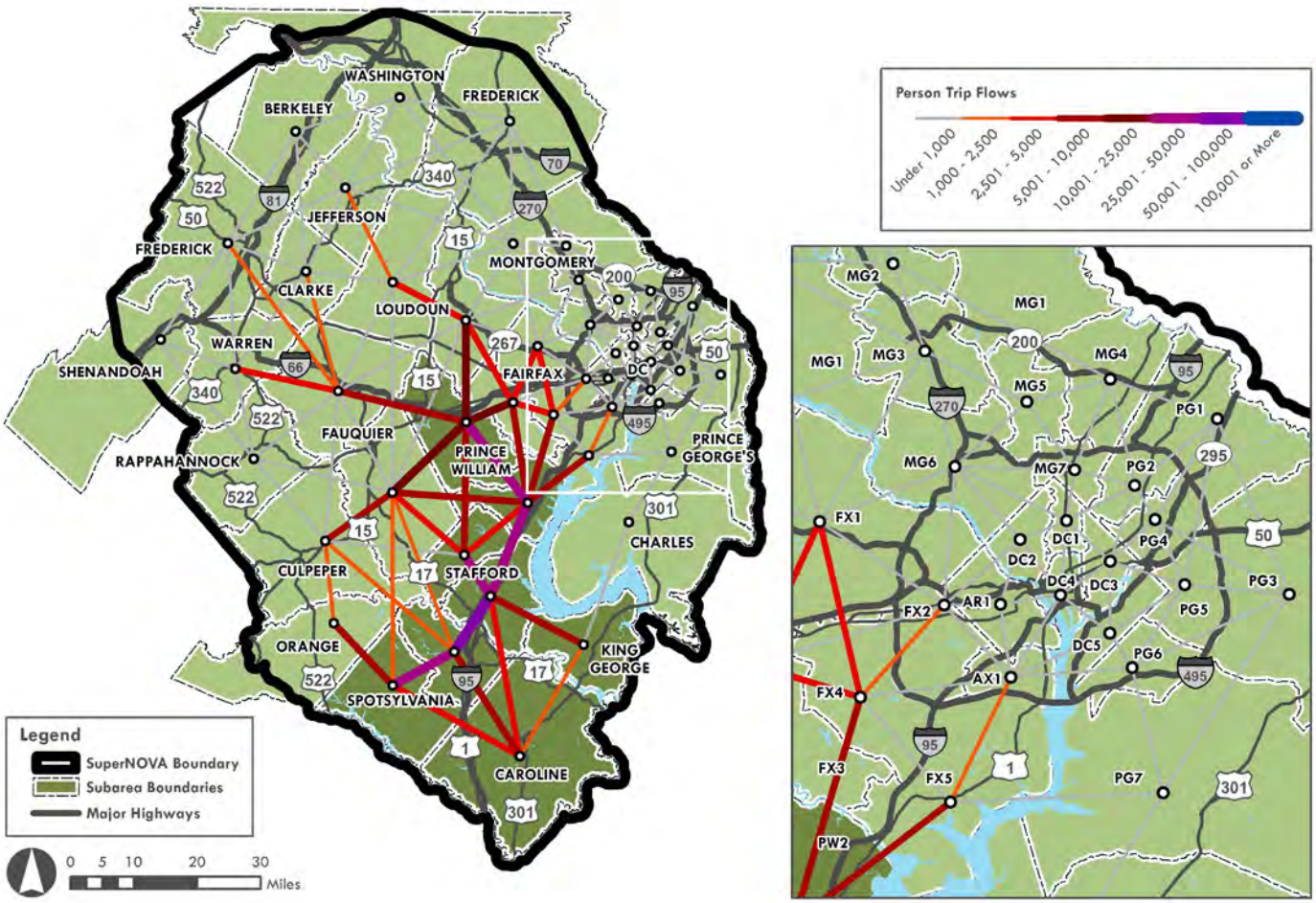


Figure 4.37: 2040 Daily Work Person Trips to South Subarea

Maryland Subarea Travel Patterns

The Super NoVa region includes the following Maryland counties:

- Montgomery County
- Prince George's County
- Frederick County
- Charles County
- Washington County

For purposes of this travel pattern analysis, Prince George's and Montgomery Counties were each subdivided into seven districts, consistent with US Census PUMA boundaries.

Daily home-to-work-related person trips for the Maryland counties within the Super NoVa region are approximately 888,000 (e.g., 1.7 million total daily work trips). **Table 4.8** presents total daily home-to-work trips for the five Maryland counties that are within the defined Super NoVa region.

Table 4.8: Maryland Subarea Daily Home-to-Work Trips (Peak Direction Trips)

District	2007	2040	Difference	Growth Rate
Montgomery	414,097	568,935	154,838	37.4%
Prince George's	310,455	394,494	84,040	27.1%
Frederick	71,163	123,806	52,643	74.0%
Charles	40,435	66,643	26,207	64.8%
Washington	52,424	77,959	25,535	48.7%
TOTAL	888,574	1,231,838	343,264	38.6%

All counties but one (Washington County) are "exporters" of work trips. In other words, there are more trips leaving the county than entering the county in the morning peak period, as illustrated in **Figure 4.38** and **Figure 4.39**.

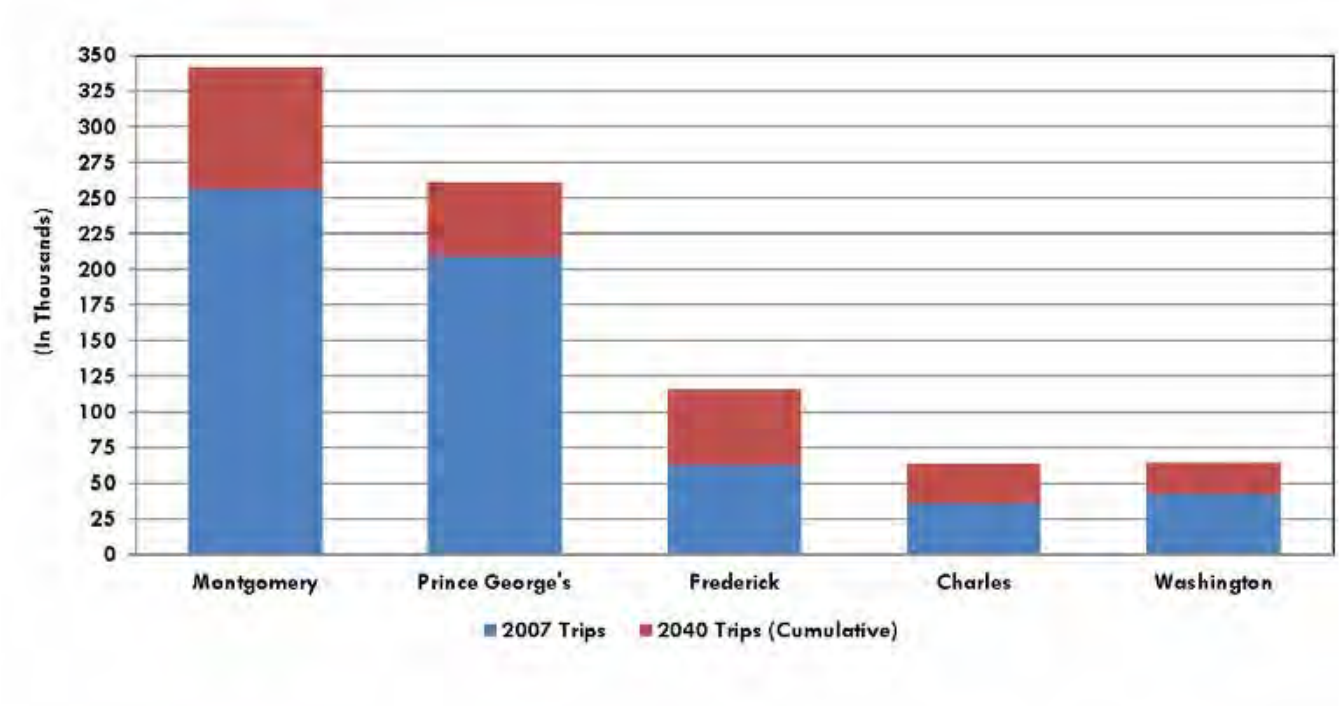


Figure 4.38: 2007 and 2040 Daily Work Trips From Maryland Counties

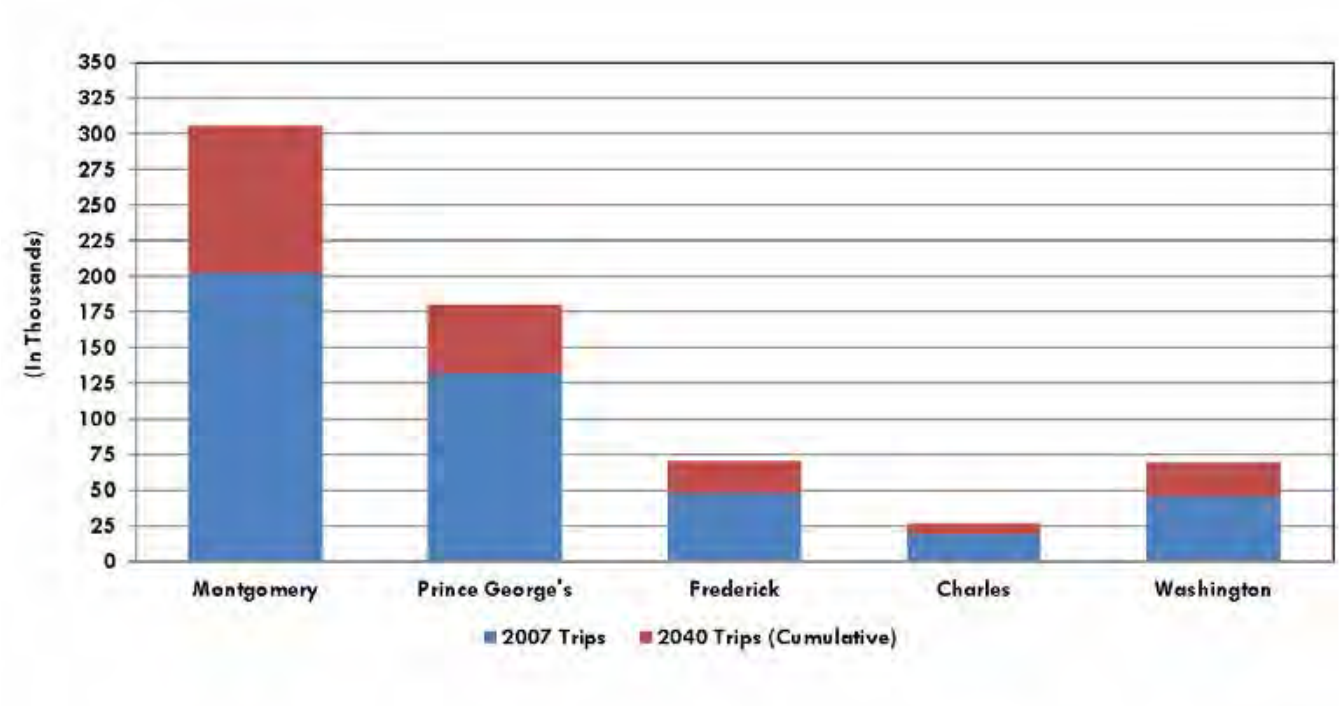


Figure 4.39: 2007 and 2040 Daily Work Trips To Maryland Counties

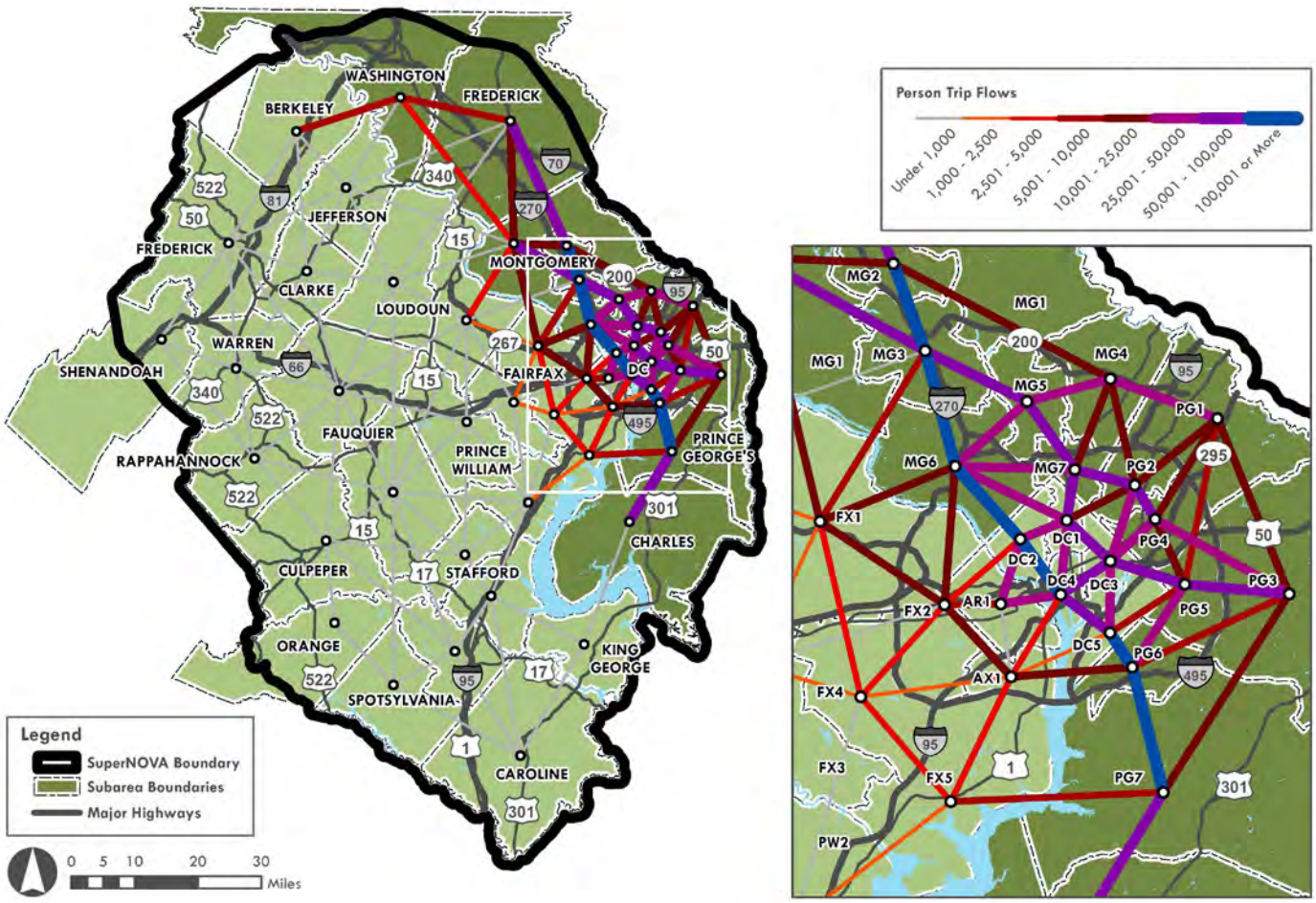


Figure 4.40: 2040 Daily Work Person Trips from Maryland Subarea

Figure 4.40 and **Figure 4.41** present spider line diagrams of 2040 daily work trips coming from and going to Maryland Counties. As noted in these figures, predominant work trip flows tend to remain within Maryland or to/from D.C., with some flows reaching to the Arlington/Alexandria area.

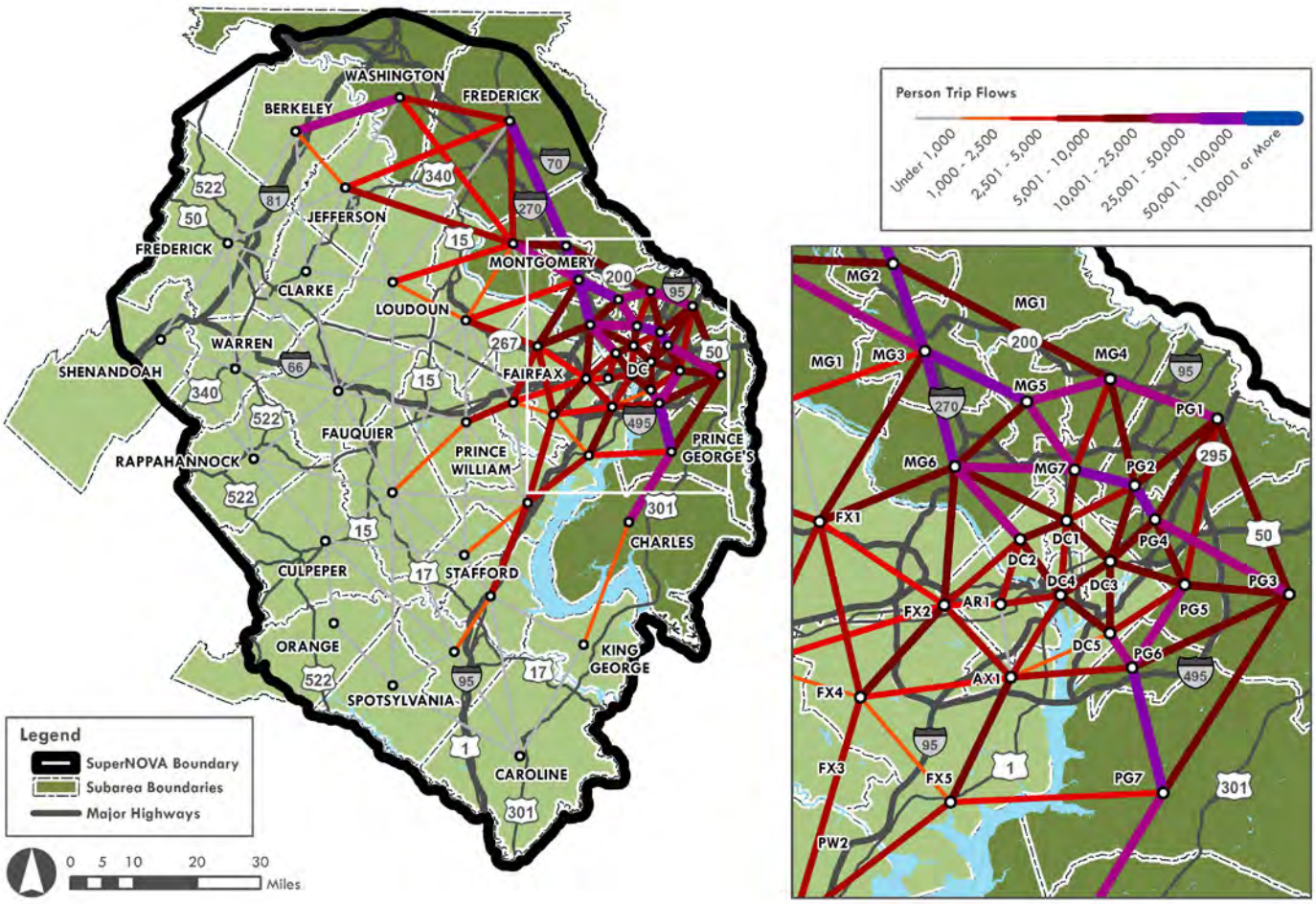


Figure 4.41: 2040 Daily Work Person Trips to Maryland Subarea

POTENTIAL FUTURE TRANSIT SERVICE AND PROGRAM GAPS AND NEEDS

Inner Subarea Needs

The inner subarea, as defined for this Super NoVa analysis, includes D.C., Arlington County, the City of Alexandria, and Fairfax County. Overall, work and non-work trips generated in Arlington, Alexandria, and Fairfax are anticipated to grow by more than 30 percent by 2040. Transit service needs for Maryland counties that are typically considered as part of the region's inner area (Prince George's and Montegomery Counties) are addressed in a subsequent section that covers all five Maryland counties that have been included in the Super NoVa study area. The following focuses on mobility needs from the inner area to non-inner activity centers, as well as localized service needs.

Mobility Needs to Other Subarea Activity Centers

- 2040 travel volumes from the designated inner jurisdictions to other jurisdictions are largest to eastern Prince William County, northern Prince William County, and eastern Loudoun County. Transit service from the inner area to all three of these jurisdictions is limited. There are presently strong commuter services into the inner area from these three areas (VRE and commuter bus), but minimal reverse commuter services from the inner area to these three areas.
- 2040 travel volumes also are somewhat strong between segments of Fairfax County and the I-95 corridor. Travel volumes for this particular corridor are anticipated to more than double. As was noted for the other travel patterns, there is presently strong commuter services into the inner area from the I-95 corridor (VRE and commute bus), but no reverse commuter services from the inner area to this area.

Mobility Needs to Serve Localized Trips

- Washington, D.C., Arlington and Fairfax Counties, and the City of Alexandria are already served by Metrobus and Metrorail, with more localized services offered by the Fairfax Connector, ART, and DASH.
- Metrorail's existing core capacity constraints limit the ability for expanded peak period usage for both localized and regional travel.
- The travel pattern analysis that has been completed for this study indicates significant interaction between portions of Fairfax County and neighboring Loudoun County and Prince William County. There are presently limited services that cross these jurisdictional lines.

Northwest Subarea Needs

The Northwest subarea includes Loudoun County, Clarke County, and Frederick County, VA; and Berkeley County and Jefferson County, WV. Work and non-work person trips are anticipated to grow by 78 percent in this subarea. The largest volume of trips presently generated in the Northwest subarea is from eastern Loudoun County. This will continue to be the case in 2040, with almost half of this subarea's trips coming from this district.

Mobility Needs to the Inner Subarea

- There is presently significant work-related travel from Loudoun County to the inner area (specifically, Central D.C., Tysons, and Arlington). This will continue to be a significant travel movement in the future, with an anticipated trip growth of more than 50 percent. LC Transit presently provides commuter bus service that addresses this travel movement; however, LC Transit buses and county park-and-ride lots are presently operating near or at capacity. The planned Metrorail Silver Line will help address this need.
- Work-related travel volumes to the inner area from other counties in the Northwest subarea are much lower than the Loudoun County volumes.

Mobility Needs to Other Subarea Employment Centers

- Eastern Loudoun County is the biggest work attraction in the Northwest subarea. Significant travel flows to this district are coming from Fairfax County, northern Prince William County, and Frederick County, VA; Jefferson County, WV; and Frederick County, MD; thus, travel to this district is very dispersed. There is presently very limited reverse commute transit services from Fairfax County to this district. There are no direct transit services between Loudoun County and the other counties listed above.
- There also is substantial travel from Northwest subarea counties to Tysons Corner/Dulles Corridor. This Fairfax area was one of the top three destinations for Loudoun County and Clarke County, VA and Jefferson County, WV trips.

Mobility Needs to Serve Localized Trips

- Significant travel growth is anticipated in Loudoun County. This includes growth in localized trips—both work and non-work. Loudoun County is served by a local transit system that serves primarily the Town of Leesburg and portions of eastern Loudoun County. Significant local service expansion will be needed to keep pace with the anticipated travel growth.
- Future year trip tables also indicate significant interaction with adjacent counties, particularly with Fairfax County; thus, suggesting the need for integrated local transit needs across county boundaries.
- Frederick County, VA has the second highest volume of work and non-work trips in this subarea, (second to Loudoun County). There are significant volumes of trips within the county, and to/from adjacent counties, such as Warren County to the south and Berkeley County to the north. Currently, the only transit service in Frederick County, VA is within the Winchester city limits. Although future plans call for connections to MARC trains and Loudoun County, there are presently no connections to regional bus or rail.
- Local transit service in Clarke County is presently demand-response service. Of the work trips that originate in Clarke County, 51 percent are projected to stay in 2040; thus, expanded local service to Clarke County may be warranted.
- Non-work related trips traveling from Clarke County and Frederick County, VA tend to travel to the western subarea to Culpeper, Orange, Fauquier, and Warren Counties, where there is no indirect or direct transit service available. Jefferson County and Loudoun County District 1 non-work trips leaving the county tend to go to Loudoun County District 2, and non-work trips that leave Loudoun County District 2 travel to Fairfax County, all of which have indirect or direct transit service.

West Subarea Needs

The West subarea, as defined for the Super NoVa project, includes Fauquier, Culpeper, Orange, Rappahannock, Warren, and Shenandoah Counties. Some of the counties within the West subarea presently have the lowest populations and population densities in the Super NoVa region, thus have low volumes of trips; however, work-related travel in this subarea is anticipated to grow by an overall 93 percent and non-work travel by an overall 83 percent. A substantial amount of this growth is expected to occur in Fauquier County.

Mobility Needs to the Inner Subarea

- The largest travel flows to the inner area are coming from Central and South Fauquier County, with those travel flows going to central D.C., Tysons, and Arlington. This travel market is served by one commuter bus route that makes just one morning and one afternoon trip; thus, there is a clear need for substantial expansion of transit service to address this market, given the anticipated travel growth projections.
- Travel flows into the inner area diminish significantly west and south of Fauquier County.

Mobility Needs to Other Subarea Employment Centers

- There are anticipated to be significant travel flows to Tysons/Dulles Corridor from Fauquier County, Culpeper County, and Warren County (e.g., the I-66 and US 15/29 corridors). There is presently no transit service available to address these travel markets.
- There also are anticipated to be significant travel flows to western Prince William County from these same three counties. Once again, there are no transit services available to address these travel markets.

Mobility Needs to Serve Localized Trips

- The travel pattern analysis suggests there will be a substantial increase in both work and non-work travel that remains within Fauquier County, and travels to adjacent counties. Existing local transit service in Fauquier County is limited to Warrenton.
- Culpeper County also is anticipated to see large increases in localized travel demand, with much of that demand going into neighboring Fauquier and Orange Counties, thus suggesting the need for expanded localized transit services.
- There is somewhat significant trip interaction between Warren and Frederick Counties. Existing service in Warren County is presently limited to the Town of Front Royal.
- There is no public transit service in Rappahannock or Shenandoah Counties.

South Subarea Needs

The South subarea, as defined for the Super NoVa project, includes Prince William, Stafford, Spotsylvania, Caroline, and King George Counties and the City of Fredericksburg. Substantial travel growth is anticipated in the South subarea of the Super NoVa region (89 percent), with Prince William County travel increasing by more than 75 percent and travel from the other counties more than doubling in size.

Mobility Needs to the Inner Subarea

- Several of the South subarea districts have a strong commuter orientation to the inner area via I-66 and I-95, including those in Prince William and Stafford Counties, and Northern Spotsylvania/Fredericksburg.
- Looking first at the I-66 corridor and the western Prince William, approximately half of all work trips produced in this district are attracted to the inner area, both now and in 2040. This movement is directly served by PRTC's commuter bus services (OmniRide and Metro Direct) and rail service (VRE and Amtrak). These trips are likely being produced not only in Manassas and Manassas Park, but also in growing population centers such as Gainesville and Haymarket. Destinations are fairly concentrated in D.C., Arlington, and Alexandria, but dispersed within Fairfax County. PRTC currently only provides connections to Washington Metropolitan Area Transit Authority (WMATA) Metrorail stations at West Falls Church and Vienna to serve locations in Fairfax County.
- The majority of the work trips attracted to the inner area of the I-95 corridor are produced in the eastern Prince William. The districts in Stafford County and northern Spotsylvania/Fredericksburg also produce a significant number of work trips, which are anticipated to grow by 86 percent by 2040. Destinations are fairly concentrated in D.C., Arlington, and Alexandria, but dispersed within Fairfax County. Commuter bus service from Prince William County is provided by PRTC, while Stafford and Fredericksburg are currently served (Quick's and MARTZ) operating limited peak period service. VRE and Amtrak also operate in this corridor. Growth in commuter service to meet the growing demand is currently limited by park-and-ride lot and train capacities.
- Reverse commute trips from the inner area, primarily from Fairfax County, are anticipated to grow to both Prince William County districts. VRE service from the inner area to both Prince William County districts is presently peak direction service only; thus, it does not serve this particular travel pattern.

Mobility Needs to Other Subarea Employment Centers

- Work trips attracted to South subarea districts are primarily produced in the immediate surrounding districts.
- In the I-66 corridor, a large number of work trips are presently attracted to western Prince William, which is anticipated to double from 2007 to 2040. The highest numbers of trips are anticipated to come from southern Fauquier County, eastern Prince William, and eastern Loudoun/Dulles Airport districts. While direct transit service is currently available from eastern Prince William via PRTC's Cross County Connector, service from eastern Loudoun/Dulles Airport and southern Fauquier is very limited or non-existent.
- In the I-95 corridor, a large number of work trips attracted to the eastern Prince William district are anticipated to come from eastern Stafford, western Prince William, and northern Spotsylvania/Fredericksburg districts. Direct transit service is currently available from western Prince William via PRTC's Cross County Connector and from eastern Stafford and Fredericksburg via VRE's Fredericksburg line.
- A large number of trips also are attracted to northern Spotsylvania/Fredericksburg districts. Those trips are more localized and coming from adjacent counties. There is transit service provided by FRED in portions of this district, but service is limited and does not fully reach out to areas where trips are originating. For example, there are a significant number of trips coming from Orange County.

Mobility Needs to Serve Localized Trips

- Areas supportive of transit service based on population and employment density within the South subarea are presently served directly by transit, through PRTC or FRED.
- There are areas of special population characteristics, particularly within the southern Spotsylvania district and Caroline County that have none or very limited transit service.
- The projected large increase in both work and non-work trips will require expansion of existing local transit services.

Maryland Subarea Needs

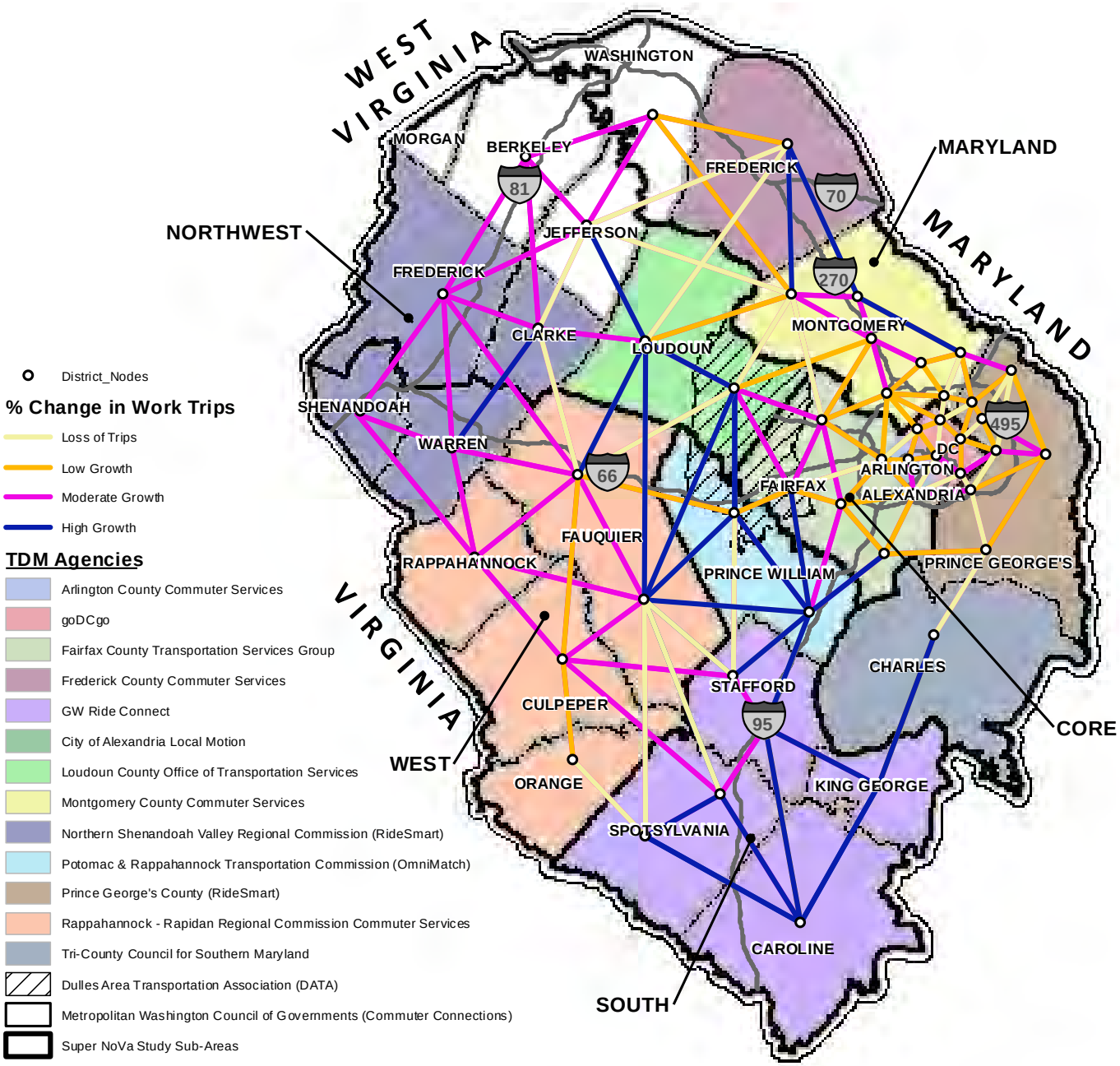
Overall, trips in the five Maryland counties (Charles, Prince George's, Montgomery, Frederick, and Washington Counties) are anticipated to grow by more than 30 percent, with Montgomery County being the largest generator of both work and non-work trips. The largest travel growth rates are expected to occur in Frederick, Charles, and Washington Counties, with Frederick County trips growing by nearly 75 percent. The following list of potential service gaps and needs is structured differently than those provided for the other subareas. This list focuses on travel patterns between Virginia jurisdictions.

Mobility Needs to the Inner Subarea

- There are existing large travel movements to Arlington from Montgomery, Prince George's, Frederick, and Charles Counties. Travel from these four counties to Arlington is anticipated to grow by more than 35 percent by 2040. Metrorail presently provides direct connectivity from three of these Maryland counties to Arlington; however, Metrorail trains presently operate at capacity in the peak periods. These core capacity issues, as noted in numerous prior studies, severely limit the ability for Metrorail to accommodate this large growth in travel to/from Arlington County.
- Although travel volumes to/from Alexandria are lower than Arlington's volume, the core capacity constraints noted above also will adversely impact Metrorail's ability to accommodate increased travel needs to Alexandria.

Mobility Needs to Other Subarea Activity Centers

- Tysons Corner/Dulles Corridor is the primary non-inner activity center in Virginia that is a destination for Maryland trips, particularly from Montgomery County. There is no direct service from these markets to this corridor; however, that will change with the opening of the Metrorail Silver Line. The core capacity constraints will adversely impact Metrorail's ability to accommodate increased travel needs to this area. Further, Metrorail service will not be direct from Frederick County and portions of Montgomery County.
- The other Virginia area that shows up as a destination for Maryland is eastern Loudoun County. This is particularly true for travel between Frederick, MD and Loudoun County. There are no existing or planned direct services between these two locations.

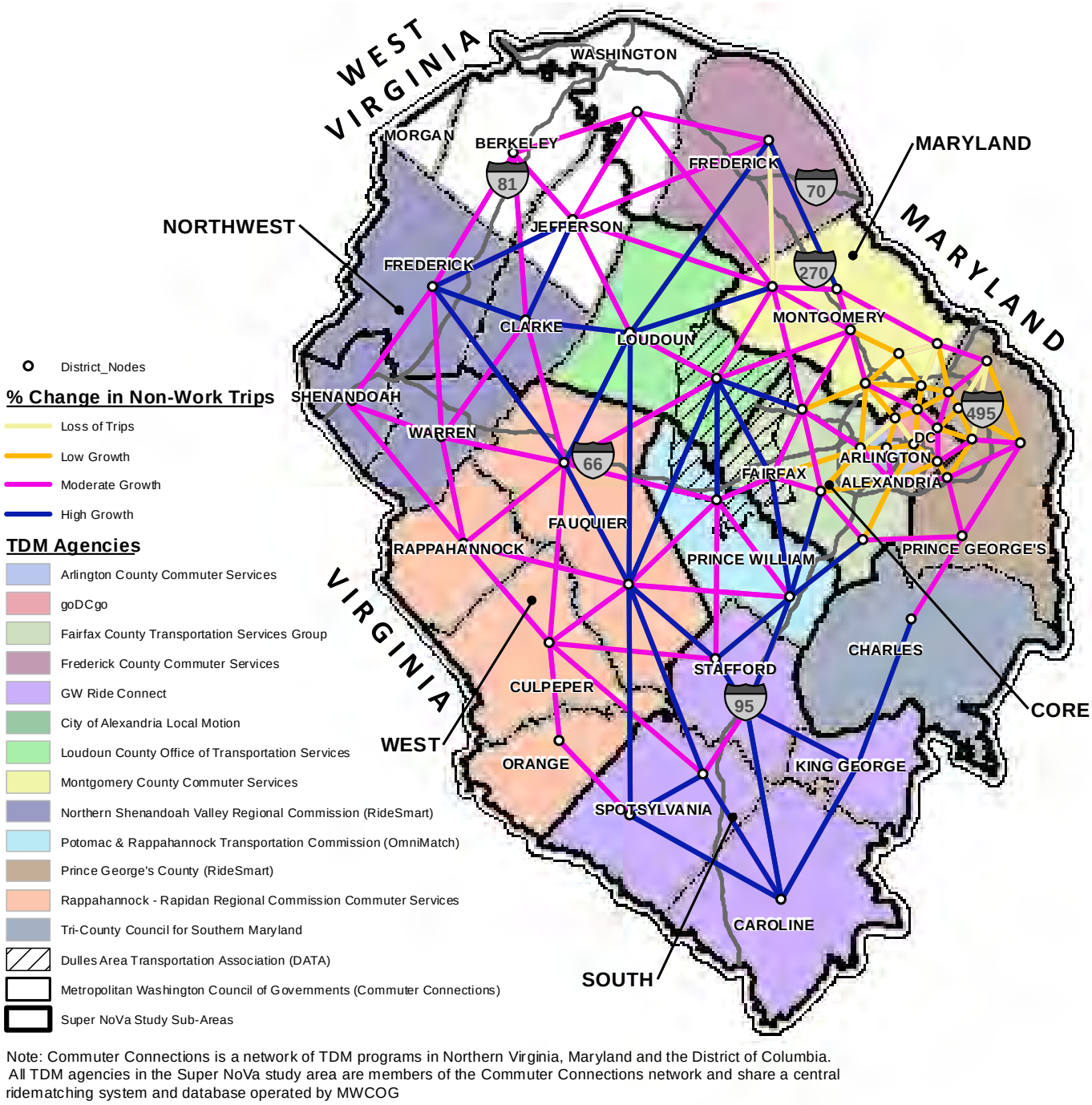


Note: Commuter Connections is a network of TDM programs in Northern Virginia, Maryland and the District of Columbia. All TDM agencies in the Super NoVa study area are members of the Commuter Connections network and share a central ridematching system and database operated by MWCOG

Figure 4.42: Rate of Change of Work Trips (2007 to 2040)

FUTURE TDM SERVICE AND PROGRAM NEEDS

Figure 4.42 shows the rate of change in work trips by 2040. The highest rates of growth in work trips occur between Loudoun, Fauquier, Stafford, Prince William, Caroline, Spotsylvania, and King George Counties in Virginia, and Frederick, Montgomery, and Charles Counties in Maryland. These areas form a ring outside the inner area. Moderate rates of growth also are anticipated in the outer ring formed by Washington, Berkeley, and Jefferson Counties in West Virginia, and Frederick, Clarke, Shenandoah, Warren, Fauquier, Rappahannock, and Culpeper Counties in Virginia. While most of these areas are served by TDM agencies, programs and service intensities will need to be expanded or increased to keep up with the travel demand.



Note: Commuter Connections is a network of TDM programs in Northern Virginia, Maryland and the District of Columbia. All TDM agencies in the Super NoVa study area are members of the Commuter Connections network and share a central ridematching system and database operated by MWCOG

Figure 4.43: Rate of Change of Non-Work Trips (2007 to 2040)

Figure 4.43 shows the rate of change in non-work trips by 2040. Similar to the rate of growth of work trips described above, the highest rates of growth in non-work trips occur in the middle ring (e.g., a ring outside the Capital Beltway and the inner area). Moderate rates of growth are anticipated in the outer ring. TDM agencies in these areas have generally focused their services for commute trips. New programs and service will be needed to serve the increasing travel demand for non-work trips.